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Konference Vyšegrádských zemí pro osvětlení
Konferencja oświetleniowa krajów Grupy Wyszehradzkiej
Konferencia Vyšehradských krajín pre osvetlenie
Visegrádi Országok Világítási Konferenciája

IIIrd Conference of the Visegrad Countries on Lighting

LUMEN V4

Czech Republic, Brno,

hotel Santon

23 – 25 June 2010

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Invitation

The Czech Lighting Society and the Organizing Committee have the honour to invite you to participate in the III[rd] Conference of the Visegrad Countries on Lighting.

The Conference will be held at the Santon Hotel situated in the vicinity of Brno reservoir on

23 – 25 June 2010

Brno, the Conference venue, represents in the framework of geographical position of V4 countries the best solution for all participants. Brno is also the metropolis of southern Moravia.

The goal of the Conference is the presentation of scientific and technical knowledge of specialists concerned with lighting and technical practice; the Conference provides a possibility of exchange of new knowledge in this area between the Czech Republic, Hungary, Slovakia and Poland, and naturally other countries. We believe that the Conference will make it possible to renew existing contacts and to establish new ones. In the course of the Conference, some points of attraction in the south of Moravia can be visited.

In the framework of the Conference, the exhibition of lighting manufacturers and suppliers will take part. Within the frame of the Conference, the sights of Brno and other sights of the region can be visited. Parts of the programme will be a visit to the National Wine Centre in Valtice and a boat trip on the Brno reservoir.

Conference working languages:

Czech, Hungarian, Polish and Slovak (English on posters).

Venue of a conference:

The Conference will be held at the Santon Hotel situated in the vicinity of Brno reservoir (**www.hotel-santon.com**). Meals will be provided at the conference venue.

How to transport to the conference venue:

from Brno - Brno

To transport from airport to Central Station, you can use bus No. 76 (from Tuřany Airport to Central Station; travelling time is approx. 21 min).

from Brno - Main Station (railway station)

From the Main Station you can use tram No. 1 (Bystrc, Ečerova). From Main Station to Dockside (Přístaviště); travelling time is approx. 27 min.

from Brno - Bus station

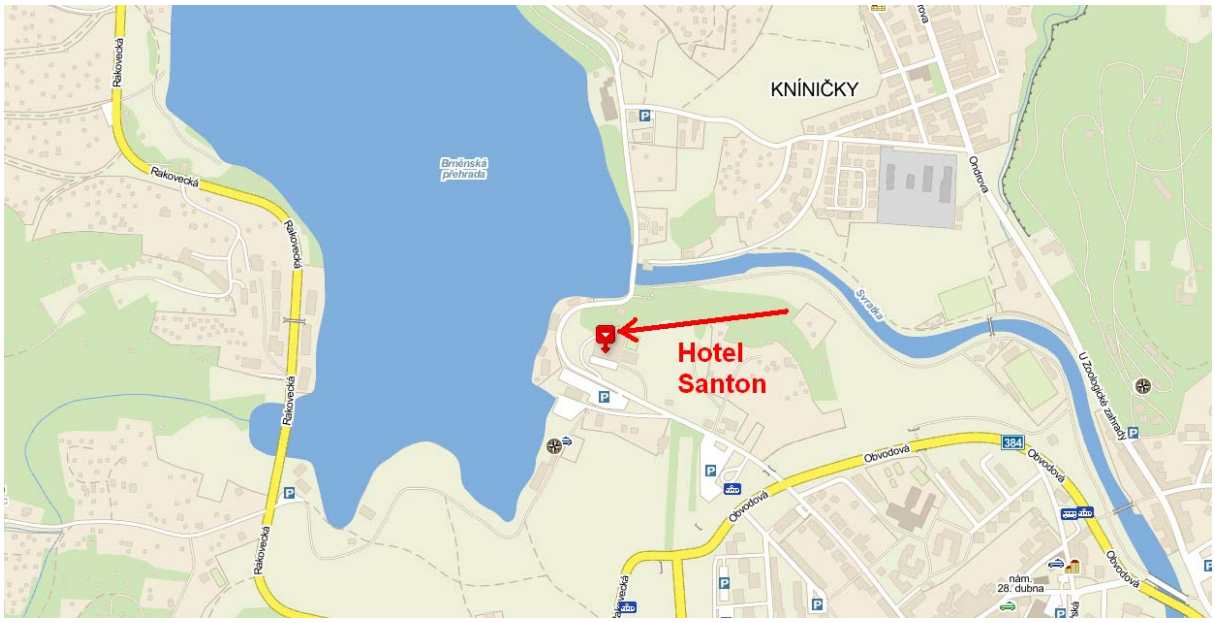
From the bus station is best way to walk (5 min) to the Main Station along the Shopping centre Vaňkovka and then you can use tram No. 1.

from Brno – city centre

From the city center (bus stop Česká) can be used tram No. 3 (direction - Bystrc, Ečerova) and tram No. 11 (direction - Bystrc, Rakovecká) to Dockside (Přístaviště); travelling time is approx. 20 min.

to the Brno by car

When you arrive to the Brno by the highway No. D1, take exit No. 190 (Brno - západ, BVV) and then direction (Bystrc přehrada).



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Conference program

23 June (Wednesday)				
9:00 - 13:00	Participant Registration, Accommodation			
12:00 - 13:00	Lunch			
13:00 - 13:30	**Conference Opening**			
13:30 - 14:00	Exhibitors Inputs			
14:00	**1. Section – Public Lighting – Lectures Presentation**			
14:00 - 14:30	Jiří Habel, Petr Žák	The Future of Public Lighting	VP	CZ
14:30 - 14:45	Coffee break			
14:45 - 15:00	Ivette Mancz, Péter Schwarcz	Energy Efficiency Indicators in Street Lighting Applications	P	HU
15:00 - 15:15	Małgorzata Górczewska, Sandra Mroczkowska	Valuation of road lighting parameters for luminaires with LED	P	PL
15:15 - 15:30	Luděk Hladký	Management of lighting systems based on many variables	P	CZ
15:30 - 15:45	Marek Bálský, Rudolf Bayer	Comparison of real street lighting with sodium lamps and LEDs	PP	CZ
15:45 - 15:50	Ferenc Szabó, Zoltán Vas, Péter Csuti, János Schanda	Experimental investigation of the Purkinje effect in case of traditional and modern street lighting luminaires	PP	HU
15:50 - 15:55	Jiří Habel, Petr Žák	Energy demandingness of lighting systems	PP	CZ
15:55 - 16:00	Dionýz Gašparovský, R. Bagačka, Petr Janiga	Development of standardized algorithm and code for roadlighting calculations	PP	SK
17:00	Visit to the National Wine Centre in Valtice			

24 June (Thursday)				
8:00	Breakfast			
9:00	**2. Section - Outdoor Lighting and recycling – Lectures Presentation**			
9:00 - 9:30	Zoltán KOLLÁTH	Monitoring and Modelling Obtrusive Light in Nature Park	VP	HU
9:30 - 9:45	Tomáš Novák, Stanislav Mišák, Karel Sokanský	Use of renewable energy to power the public lighting luminaire	P	CZ
9:45 - 9:55	Béla Kovács	The take-back, collesction and recycling systém of lighting equipments in the Hungary	PP	HU
9:55 - 10:05	Alexandr Hanousek	Collection and Recycling Components from the Luminaires in the Czech Republic	PP	CZ
10:05 - 10:15	Oliver Čelko	Collection and Recycling Components from the Luminaires in the Slovakia	PP	SK
10:15 - 10:30	Klara Wenzel	Colored lights in nature	PP	HU
10:30 - 10:45	Coffee break			

10:45	**3. Section – Daylight, Hygiene - Lectures Presentation**			
10:45 - 11:00	Dariusz Sawicki	To See or Not to See– Reflections on Human Color Perception	P	PL
11:00 - 11:15	Konrad Domke, Marcin Pelko	Evaluation of photobiological effects of fluorescent lamps used for general lighting purposes	P	PL
10:15 - 11:30	Ágnes Vidovszky-Németh, János Schanda	Circadian rhythm and LED lighting	P	HU
11:30 - 11:45	Stanislav Darula, Peter Rybár, Jitka Mohelníková, Marek Popeliš	Measurement of tubular light guide efficiency under the artificial sky	P	SK
11:45 - 12:00	Miroslav Kocifaj	HOLIGILM-based Simulations for Bended Light-guides	P	SK
12:00 - 12:15	Jiří Plch, Jitka Mohelníková	Influence of colour of shading obstacles on indoor daylighting	P	CZ
12:15 - 13:15	Lunch			
13:15	**4. Section - Daylight, Hygiene, Indoor Lighting - Lectures Presentation**			
13:15 - 13:20	Anton Rusnák	Analysis of measurement and evaluation of colorimetry sky types	PP	SK
13:20 - 13:25	Narcyza Barczak-Araszkiewicz, Bogdan Ślęk	End of life lamps at the lighting market in Poland	PP	PL
13:25 - 13:30	Wiesława Pabjańczyk, Roman Sikora, Przemysław Markiewicz, Zbigniew Gabryjelski	The influence of environmental conditions on work of the LED luminaries	PP	PL
13:30 - 13:35	Stanislav Darula, Richard Kittler, Peter Oberman	Luminance distribution in an office during daytime	PP	SK
13:35 - 14:05	Alfonz Smola, Dionýz Gašparovský, Petr Janiga	Experience with implementation of energy certification of lighting in Slovakia	VP	SK
14:05 - 14:25	Marián Flimel	Ergonomics and system approach to the light climate on workplaces	P	SK
14:25 - 14:45	Dionýz Gašparovský, E. Erkin	EHB LiteCalc – a software tools for energy certification of lighting	P	SK
14:45 - 15:00	Coffee break			
15:00	**5. Section - Daylight, Hygiene, Indoor Lighting - Lectures Presentation**			
15:00 - 15:30	Elżbieta Janosik, Stanisław Marzec, Marcin Łaciak	The lighting conditions in the Polish flats – surveys results	P	PL
15:30 - 15:35	Jan Škoda, Petr Baxant	Effect of Directional Reflectance in Lighting	PP	CZ
15:35 - 15:40	Péter Csuti, Balázs Kránicz	Anomalies of the correlated color temperature	PP	HU
15:40 - 16:10	Exhibitors Inputs			
16:10 - 16:50	**Posters Presentation**			
17:30	Party on the boat on the Brno reservoir			

25 June (Friday)				
8:00	Breakfast			
9:00	**6. Section – Light sources, Luminaires, Calculations, Measurements - Lectures Presentation**			
9:00 - 9:30	Wojciech Żagan	On necessity of modification of a lighting fittings photometric data base	VP	PL
9:30 - 9:45	Marek Šmíd	CIE role in establishing best measurement practice for the development and testing in the field of and lighting, including novel luminaires and emerging lighting technologies.	P	CZ
9:45 - 10:00	Zoltan Toth	Development of ceramic metal halide lamps with ultra lumen maintenance and reliability	P	HU
10:00 - 10:30	**Posters Presentation**			
10:30 - 10:45	Coffee break			
10:45	**7. Section – Light sources, Luminaires, Calculations, Measurements - Lectures Presentation**			
10:45 - 11:00	Gabor Schulcz	Power Supplies for LED lighting	P	HU
11:00 - 11:15	Luděk Hladký	LED module	PP	CZ
11:15 - 11:20	Przemysław Skrzypczak, Konrad Domke	Cooling system of HP LED with a Peltier module – laboratory equipment	PP	PL
11:20 - 11:25	Krzysztof Wandachowicz, Giulio Antonutto	Optimization of Rotationally Symmetrical Mirror Reflector Profile	PP	PL
11:25 - 11:30	Marek Krasňan, Alfonz Smola	Aspects of measurement and transfer of refraction of light through light guide diffuser	PP	SK
11:30 - 11:45	Discussion			
11:45 - 12:00	**Closing of conference**			
12:00 - 13:00	Lunch			

Posters:

Petr Baxant, Tomáš Pavelka, Jan Škoda	Use luminance analysis for assessing the energy performance of lighting	Pstr	CZ
Tomáš Pavelka, Petr Baxant	Comparison of the current light sources lifetimes	Pstr	CZ
Jan Látal, Petr Koudelka, Vladimír Vašinek, František Dostál, Karel Sokanský	Possible use of power LEDs for lighting and communication	Pstr	CZ
Petr Koudelka, Jan Látal, Vladimír Vašinek, František Dostál, Karel Sokanský	Research of power LEDs for mobile communication	Pstr	CZ
Jan Vitásek, Petr Koudelka, Jan Látal, František Dostál, Karel Sokanský	Indoor optical free space networks – reflectivity of light on building materials	Pstr	CZ
Tomáš Maixner	Environmentalism in the public lighting	Pstr	CZ
Tomáš Maixner, Jiří Skála	Reality LED	Pstr	CZ
Tomáš Maixner, Jiří Skála	Lighting on pedestrian crossing	Pstr	CZ
Petr Žák, Jiří Habel, Jiří Plch	Comparison of real street lighting with sodium lamps and LEDs	Pstr	CZ
Tomáš Novák, Karel Sokanský, Petr Závada	Measurement of obtrusive light in terms of Czech Republic	Pstr	CZ
Tomáš Novák, Petr Závada, Karel Sokanský	Instrumentation for long term measuring of parameters under night sky	Pstr	CZ
Stanislav Mišák, Jaroslav Šnobl, František Dostál, Daniel Diviš	Hybrid power system of public lighting in smaller villages	Pstr	CZ
Stanislav Mišák, Jaroslav Šnobl, František Dostál	Power solutions for emergency lighting of tunnels,underpasses and ecoduct	Pstr	CZ
Martina Zapletalová, Jiří Novák	Calculation methods and programs for daylight lighting and comparison of their use	Pstr	CZ
Peter Jones, Clive Riddell	Taking Control of Your HID Lighting	Pstr	CZ
Petr Závada, Karel Sokanský	Diagram of daily consumption of electricity, houses appliances, distribution them into categories by importance of electricity supply	Pstr	CZ
Pavel Stupka	Different methods of the maintenance factor setting	Pstr	CZ
Zuzana Mathauserová, Jana Lepší	Glassed-in offices with PC in terms of environmental factors	Pstr	CZ
Aleš Kaňa	The Sports Park Stožice in capital city of Slovenia	Pstr	CZ
Zdeněk Bláha	Practical possibilities of lighting of pedestrian crossings	Pstr	CZ
Zdeněk Bláha	Implementation of public lighting and control system TELE in Hustopeče u Brna	Pstr	CZ
P. Vrbík, Z. Židková, Petr Baxant	Effect of night illumination advertising banner on the surrounding residential houses	Pstr	CZ
Josef Neduchal	Helvar / 920 IMAGINE ROUTER commercial architectural lighting control DALI / DMX / SDIM	Pstr	CZ

Anton Rusnák	Methodology for measuring the sunlight	Pstr	SK
Dionýz Gašparovský, M. Mácha	Deformation of the photometric characteristics of luminaires due to pollution of environment	Pstr	SK
Dariusz Heim, Eliza Szczepańska	Visual quality in working spaces with entirely diffuse daylight – measurements vs. simulation	Pstr	PL
Tomasz Targosiński	TWO-DIMENSIONAL VISUALIZATION OF RETROREFLECTION COEFFICIENTS (CIL)	Pstr	PL
Andrzej Wiśniewski	The possibility of regulation luminous flux of metalhalide lamps	Pstr	PL
Dariusz Czyżewski	Luminance distribution of LED luminous surface	Pstr	PL
Dariusz Czyżewski	Monitoring of road lighting conditions illuminated with the use of LED luminaires	Pstr	PL
Konrad Domke, Joanna Ratajczak	Spectrum analysis of the usefulness of light sources forbuilding sun simulators	Pstr	PL
Irena Fryc	LED's spectral power distribution under different condition of operating temperature and driving current	Pstr	PL
Grażyna Gilewska	Matching algorithms during analysis of medical imaging parameters: possibilities and constrains	Pstr	PL
Marian Gilewski	A comparison of PWM driving and DC driving of LEDs lamp	Pstr	PL
Marian Gilewski	A multichannel DC driver of power LEDs	Pstr	PL
Lech Grodzki	The stabilizing of RGB LED colour with constant-current driving	Pstr	PL
Lech Grodzki	Constant-current Driving of the RGB LED	Pstr	PL
Piotr Kaźmierczak, Małgorzata Kalisz	More light on the road – tests of passing lights with modern halogen filament lamps.	Pstr	PL
Rafał Krupiński	The latest designs of illumination worked out in Lighting Division of Warsaw University of Technology	Pstr	PL
Łukasz Litwiniuk	The calibration of the tristimulus colorimeters	Pstr	PL
Wojciech Moćko	Concept of application of variable lighting surface in vehicle signalling lamps	Pstr	PL
Dorota Mozyrska, Irena Fryc	Approximation spectroradiometric data by fractional model	Pstr	PL
Wiesława Pabjańczyk, Roman Sikora, Przemysław Markiewicz, Zbigniew Gabryjelski	Influence of LED luminaires on supply network	Pstr	PL
Michał Pawlaczyk	Estimation of equivalence colour contrast and luminance within llumination	Pstr	PL
Piotr Pracki	The comparative analysis of road lighting energy efficiency	Pstr	PL
Łukasz Stelmach, Dariusz Sawicki	The Simple Model of Diffraction Grating	Pstr	PL
Dariusz Sawicki	Spherical Harmonics: the New Algorithm of the Light Point Figure Simulation	Pstr	PL

Sebastian Słomiński	The dynamic mapping of luminance in analytical model of light source – the study results	Pstr	PL
Dorota Sobótko	The photometric calibrator	Pstr	PL
Grzegorz Szajna	Photometric and radiometric measurements in Photometry and Radiometry Laboratory Central Office of Measures (Poland)	Pstr	PL
Zbigniew Turlej, S. Abramik, E. Lisak,W. Władziński	The concept for the RYGB LED lumia	Pstr	PL
Wojciech Wojtkowski	SEPIC converter for high power LED lighting	Pstr	PL
Małgorzata Zalesińska	Energy's efficiency and economic aspects in road lighting	Pstr	PL
Sławomir Zalewski	Calculation of Road Lighting realized on LEDs	Pstr	PL
Andrzej Pawlak	Local Lighting Luminaires for People with Eyesight Impairments	Pstr	PL
Robert Andre, Paweł Baranowski	The Art of a Wider Look	Pstr	PL
Grzegorz Szajna	Calibration of tristimulus colorimeters	Pstr	PL
Gyorgy Takacs	Role of illumination in property protection	Pstr	HU

Legend:	
VP	Invited Paper (30 minutes)
P	Presented paper (15 minutes)
PP	Short-presented poster paper (5 minutes)
Pstr	Poster paper without presentation

Accompanying person programme

23 June (Wednesday)

9:00-16:00	- Brno sightseeing tour (individual visit)
18:00-24:00	- visit to the National Wine Centre in Valtice

24 June (Thursday)

9:00-15:00	- Slavkov battlefield, Slavkov manor house (if will be interested more than 20 persons will be provided bus)
16:30-24:00	- party aboard a steamboat on the Brno reservoir

25 June (Friday)

9:00-12:00	- Macocha gorge near Brno (if will be interested more than 20 persons will be provided bus)

Coordinating Committee:

Czech Republic:	Prof. Karel Sokanský
	Dr. Tomáš Novák
Hungary:	Dr. János Schanda
	János Nagy
Poland:	Dr. Jan Grzonkowski
	Prof. Wojciech Żagan
Slovakia:	Prof. Alfonz Smola
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The authors of the conference papers may publish their work in the Journal

All the information concerning the Jornal you may find on:

http://pe.org.pl/index.php?lang=1&PHPSESSID=4f4d0b851dddf7e6ceaddbe310e0d7e7

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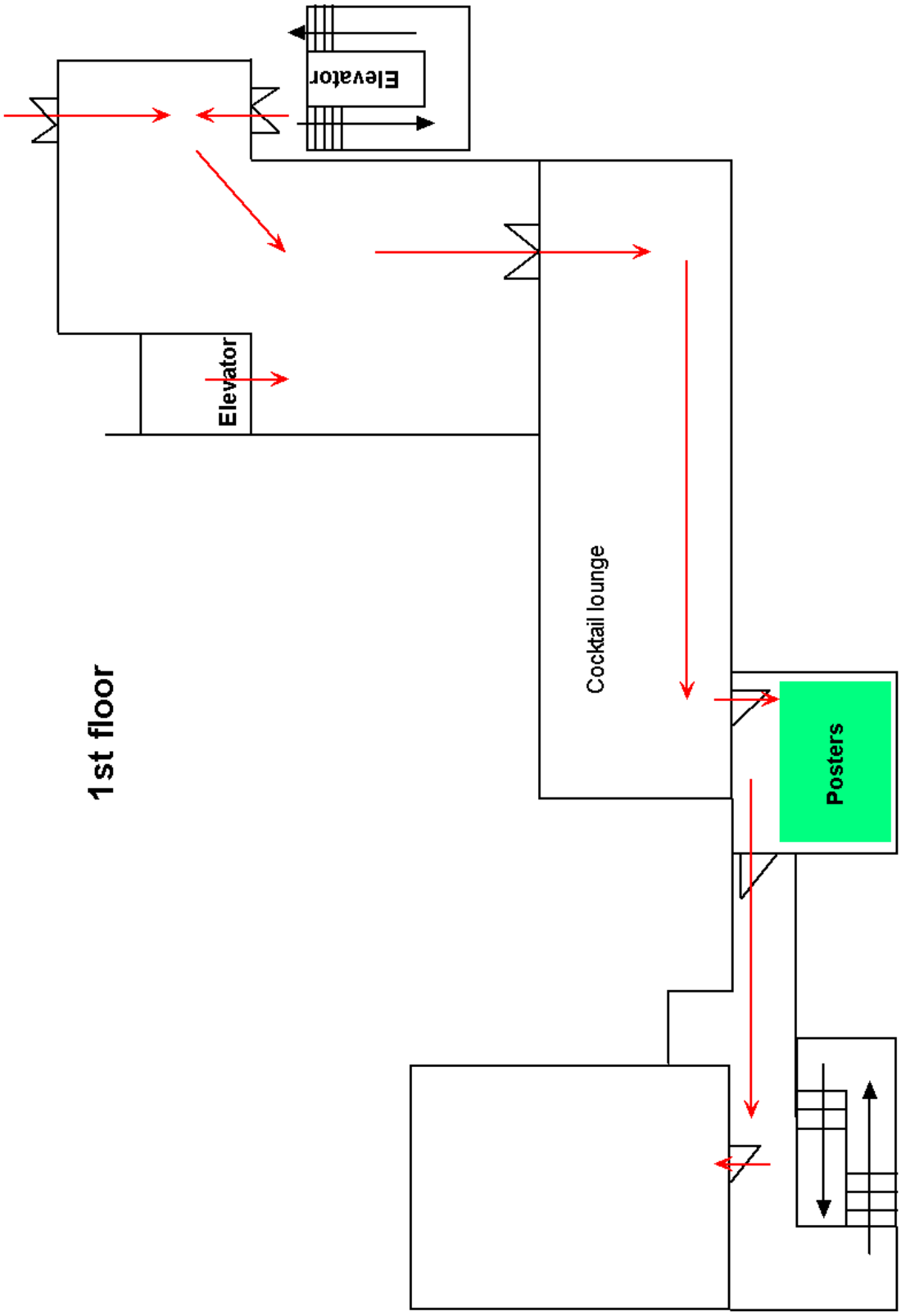
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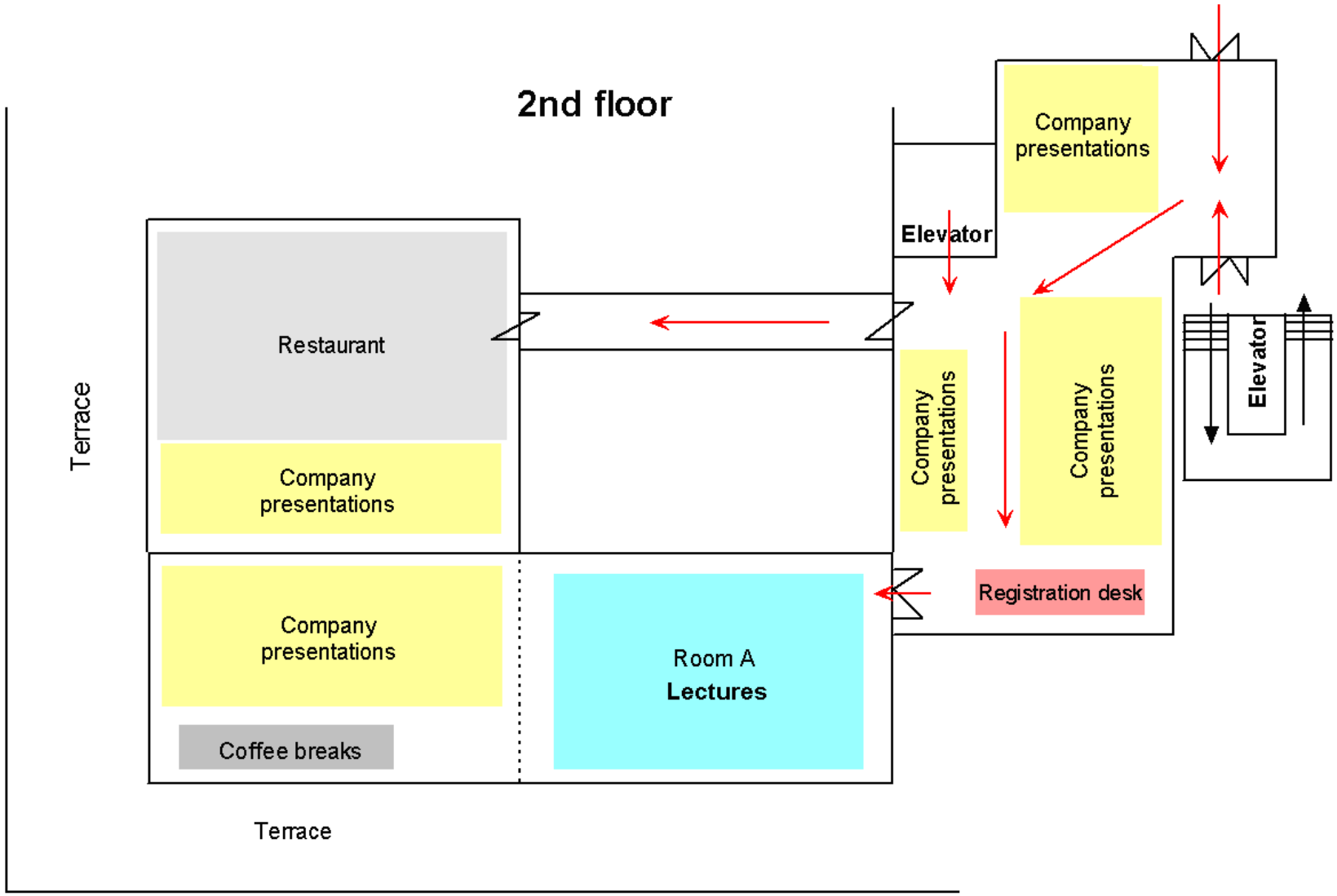
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Abstracts

The Future of Public Lighting

Jiří Habel, Petr Žák

Public lighting is now entering into a new era in which a lot of changes can be expected. Design and public lighting system solutions will be more and more influenced by both new technical equipments, changes in legislation and by new conceptual approaches. The impulse for these changes will be not only the very fast development in the area of new lighting sources, optic systems and luminaires, but also the ways of power supply, control and regulation of the lighting systems. The results of research in the field of visual performance in mesopic vision will have no less important impact. New approaches to public lighting system solutions will represent significant changes not only in the quality of illumination, energy demandingness and elimination of public lighting side effects, but also in the general appearance of the nocturnal environment of municipalities.

Notes:

Monitoring and Modelling Obtrusive Light in Nature Parks

Zoltán KOLLÁTH

Abstract. The first 'International Dark-sky Park' in Europe was established at the Zselic Landscape Protection Area in Hungary. The nomination of the park was a result of cooperation among the Hungarian Astronomical Association, the Lighting Society of Hungary, and Duna-Drava National Park Directorate. A special monitoring program has been carrying on to survey the quality of the night sky using 'Sky Quality Meters' and DSLR cameras. The main conclusion of our measurements is that the local villages have only a minimal effect on the quality of the sky. There are light-domes due to the neighboring cities only close to the horizon, the main source of obtrusive light is the city of Kaposvár. The anthropogenic component of zenith luminance of the night sky is obtained as the function of the distance from the city center of Kaposvár. Our data were modeled by radiation transfer calculations. These results can help to draw attention to the energy emitted useless to the space and to protect our nocturnal landscape of nature parks for the next generations.

Notes:

Experience with implementation of energy certification of lighting in Slovakia

Smola, A., Gašparovský, D., Janiga, P.

In Slovakia, practical certification of buildings, including built-in lighting systems, ran since the beginning of the year 2008. Of course, this process is based upon long-term preparatory works on legislative and methodical conditions. It is important to mention that energy certification of buildings is a completly new field and only first practical experience could bring necessity to modify the methodology. Thus, since October 2009 a new regulation is in force which besides new conditions also precises methodical requirements for ellaboration of energy certificates. Slovakia holds leading positions in this field, indeed, and can mediate his expertise also to other countries with similar geografical location and where legislative environment allow to do so. The paper is therefore aimed to summarize known experience and to bring information on practical solutions of identified problems. It is expected that results will be aimed also to possible revision of the EN 15193 standard which is deemed to be a methodical background for energy certification of lighting systems in buildings.

Notes:

On necessity of modification of a lighting fittings photometric data base

Wojciech Żagan

The paper presents a new approach and new possibilities of presentation of photometric data of lighting fittings. The present way of presentation – a surface of intensity distribution (luminous intensity or luminance) presents an insufficient scope of information. Application of a fitting requires additional data necessary to determine its features for illumination of a surface from small distances. Besides, presented or calculated luminance is an average one, but not an accurate luminance of different parts of a fitting. The actual distribution of luminance is unknown. This imperfection of the traditional way of data presentation causes miscalculations, particularly when simulation programmes are applied. Nowadays it is possible to replace a traditional surface of intensity distribution of luminous intensity or luminance with a properly prepared base of luminance distribution.

Notes:

Energy Efficiency Indicators in Street Lighting Applications

Ivette Mancz, Péter Schwarcz

Energy efficiency is one of the key issues in our economy in the 21st century. EU is looking for applications where energy reduction targets can be achieved. Lighting is one of the 'low-hanging fruits'. That is why important to review of existing efficiency indicators for street lighting applications and call for new ones if they seem useful. Well-known indicators have been established for lamps (**efficacy**) and luminaries (**utilisation factor**) and used in national and international regulations. Nevertheless, the proper applications and maintenance of these equipments could have more impact on energy efficiency than the efficiency improvement potentials in the components of which composed of. That is why important to review of existing efficiency indicators for street lighting applications and call for new ones if they seem useful. One of the most commonly used energy efficiency indicator of street lighting is the **gross energy** used for one unit of the road, generally for 1 km. The unit is 1 kW/km. The main advantage of it is its simplicity. The main disadvantage is the indicator is not comparable in case of different road width or arrangement. This paper will give a modified definition, which reflect better the extent of the area lit. The **Street Lighting Energy Efficiency Criterion (SLEEC)** already mentioned in some national survey, but has not reached international recognition yet. This measures the energy required for a unit area and quantity of light arriving on the road surface (illuminance) or reflected by it (luminance). One of the key questions is that actual (calculated or measured) value is the reference or the target design value defined by the relevant recommendation. The next possible indicator is how much light is used compared the theoretically best solution and it is named **'installation quality factor' (q_i)** defined as $q_i = Q_i/Q_0$, where Q_i the luminance coefficient of a lighting installation and Q_0 is the same, but considering C2 as road surface reflection characteristics. The name of the factor is not very good as nothing to do with the quality of the installation, but give good indicator, how the energy efficiency of an installation can be influenced by changing parameters of the lighting design. The paper will show the relation between those indicators and will propose possible classification method.

Notes:

Valuation of road lighting parameters for luminaires with LED

Małgorzata Górczewska, Sandra Mroczkowska

Valuation of influence of white light in outdoor lighting has been tested for years. Usually luminous flux is determined for photopic vision, but in many cases for road lighting the level of adaptation for human eyes corresponds to mesopic vision. For such conditions using LEDs could be more useful from the point of spectral distribution of light. In the paper the results of comparation parameters of outdoor lighting will be presented for chosen LEDs.

Notes:

Management of lighting systems based on many variables

Luděk Hladký, Libor Štědroň

Abstract. Different kind of lighting systems are controlled based on different types of variable quantity. Control of lighting systems in the interiors is performed on parameters as daylight level, presence of persons, personal settings or function of the illuminated space. The aim of use of lighting controls is to increase the energy savings, get flexibility of lighting systems according to the user´s needs or adaptation of functional changes in the space solution.

Notes:

Use of renewable energy to power the public lighting luminaire

Tomáš Novák, Stanislav Mišák, Karel Sokanský

Public lighting consumes approximately 550 GWh/year annually. Decreasing of it can bring remarkable savings of electrical energy. One possibility of power consumption decreasing in public lighting systems is using renewable energy sources for their charging. Using these sources for public lighting in the certain areas can bring savings linked to investment cost decreasing because a cable line is not needed. They are the localities where the public lighting is far away from the main. This kind of the public lighting systems can work as the separate units and do not need a distribution network for their charging. We need to know information about energy balance to be able to optimize every part of these units (it means – luminaire power, useable energy from photovoltaic cell and wind powerplant and battery capacity).

Notes:

The Art of a Wider Look

Robert Andre, Paweł Baranowski

In 1986, Adam Wisniewski - a Polish writer and intellectual - formulated in his manifesto “My principles of decenrtism” the assumptions of a new trend of modern art. Decentrism hides what is the most meaningful and creates an imaginative space (intuitive, philosophic ..) in which the basic sense of artistic creation is placed. What is the most important in the work of art is located outside it. Suitably selected signs and symbols trigger off in the audience the impression of the most important object’s presence that dominates over the portrayed situation outside its physical borders (frames). Light and shadow can be such a trigger. The article illustrates how shadow makes possible that the human mind sees things that don’t exist in the picture. The authors wonder what the evolutionary cause and mechanisms of “art appeal” are and in the illustrative part they present works of a few Polish leading representatives of this art trend.

Notes:

Evaluation of photobiological effects of fluorescent lamps used for general lighting purposes

Konrad Domke, Marcin Pelko

There are limits for maximum exposure times to ensure photobiological safety (e.g. due to retinal injury) while at the same time opposite recommendations exists for different phototherapy applications (e.g. suppression of melatonin). This article summarizes spread of positive and negative photo biological effects of optical radiation available in existing portfolio of fluorescent lamps used for general lighting purposes.

Notes:

EHB LiteCalc – a software tools for energy certification of lighting

Gašparovský, D., Erkin, E.

To support energy certification of lighting, a software tool EHB LiteCalc has been created, now already in version 3.0 with new features. Methodical calculation is based on the european standard EN 15193, however, completed by Slovak national methodology and legislative requirements valid on the territory of Slovak Republic. This version is prepared with several language mutations, changing the language also national calculation methods are used. To use this software in other countries is possible, besides general normative methodology also relevant national calculation methodologies are implemented. Localisation of the software is currently under development. The paper brings information on functions and features of the software and on general level it also discusses the creation of software for the field of EPBD including methodical problems and their solutions.

Notes:

Circadian rhythm and LED lighting

Ágnes Vidovszky-Németh, János Schanda

Since the finding that short wavelength visible light excites a fourth type of light sensitive cells in of the human retina, the so called light sensitive ganglion cells (LSG cells), which has a sensitivity maximum in the blue part of the visible spectrum, and the signal of which influences the melatonin secretion into the blood, and thus the state of alertness of the person, a high number of investigations have been started to investigate and use this effect in indoor lighting. Proposals have been aired to change the correlated colour temperature (CCT) of the ambient illumination in the office in daily rhythm between 4000 K and 14.000 K. Such dynamic light might have an influence on the alertness of the occupant, but might have also negative effects on his or her state of health, as there are reports that the suppression of melatonin secretion might increase the risk of cancer. The14.000 K bluish light will certainly have a negative effect on the comfort feeling of the observer as well. An alternative way to get better balance between exciting the LSG cells, providing an adequate visual environment (i.e. keeping the correlated colour temperature between the limits as suggested e.g. by the Kruithoff diagram) and reasonable colour rendering can be achieved by using a proper mixture of LED lights. Using both coloured and white-LEDs some enhancement of the excitation of the LSG cells can be achieved by keeping the CCT below 4500 K. Critical in this respect is the spectral position of the blue LED, as this has opposite effects on the possible melatonin suppression and both CCT and colour rendering index. The possible spectral power distributions will be discussed and the influence of these on the CRI discussed. In this respect not only the traditional CRI will be considered, but based on recent research some more up to date descriptions of light source colour quality will be introduced. Important is in this respect that how the gamut area of the colours of the environment change. It will be shown that the simple gamut area is not an adequate descriptor, but the distortion of the gamut, compared to a reference illuminant, is important too. In the proposed system the reference illuminant could be an other LED source with equal CCT, but with less LSG cell exciting radiation. Based on these investigations also an advanced light source colour quality index could be worked out. It is hoped that by using only a moderate amount of the LSG cell exciting radiation the harmful effect of highly suppressing the melatonin secretion can be avoided. Further biological research would be needed to test this, before the method can be recommended to be used in practice.

Notes:

Measurement of tubular light guide efficiency under the artifical sky

Stanislav Darula, Peter Rybár, Jitka Mohelníková, Marek Popeliš

Tubular light guides are building elements transmitting daylight from exterior into building interiors. These light guides consist of a roof dome, tube with very high reflected inner surface and diffuser. After installation, light guides are exploited under various daylight conditions during whole year. The light guide efficiency depends mainly on the light reflectance of the inner duct surface and length as well as on the light transmittance of cupola and diffuser. A lot of authors have published in situ measurements of illuminances under light guides and light guide efficacy in the real buildings during the last two decades. It seems that these measurements cannot be compared without difficulties when daylight exterior conditions are not precisely documented. Daylight continually varies and it is difficult to find identical conditions for the light measurements and design comparisons. Comparable measuring conditions can be created in the laboratories under an artificial sky. In this case, it is necessary to expect restrictions of light guide dimensions of a sample and of the modelling of the sky luminance distribution. It seems that artificial skies calibrated for the CIE overcast sky model can be used for measurements of the light guide efficacy of the standard length of the tube. In the present light guide design there is missing trustworthy information about diffuse light transmission through tube with very high reflected inner surface. A discussion about measurement problems under artificial skies and about method of the light guide efficacy measurement under standard overcast sky is presented in the article.

Notes:

Influence of colour of shading obstacles on indoor daylighting

Jiří Plch, Jitka Mohelníková

The topic of the article is focused on evaluation of daylighting in a building which is shaded by neighbouring obstacle decorated in very bright colour.

Notes:

Holigilm-based simulations for bended light guides

Miroslav Kocifaj

Hollow light guides became very attractive in last decades, due to a globally recognized need for alternative light sources with low energy requirements. Light guides transport the daylight from exterior to an interior space thus making the visual conditions in more acceptable. Recent numerical tools based on flux methods enable to evaluate performance of the light guides, but these tools are inaccurate in determining the light conditions below non-lambertian diffusers. In addition, the flux methods are inapplicable for modeling the directional characteristics of light beams propagating through transparent or semi-transparent optical interfaces (usually supplying the traditional diffusers). To overcome these problems, the analytical HOLIGILM solution was originally developed for straight light pipes and now it is applied to bended pipes. The solution accepts the skylight patterns (including the sun) and after complex transformations in the bended light pipe it provides an angular distribution of light at the bottom interface of the pipe. The demonstrative results of numerical calculations based on HOLIGILM solution are presented and discussed.

Notes:

Ergonomics and system approach to the light climate on the workplaces

Marián Flimel

This article will deal about defining of complex requirements on light climate on the workplace in the area of:

a) technical parameters introduction: a1) for day light, a2) for artificial light , a3) for compound light,
b) manager approaches to workplaces,
c) staff and its perception of light climate quality on the workplace.

Precondition of system approach introduction that ensures optimal light climate is analysis of the problematic. During problematic analysis, possible risks in the state of operation will be identified. Output will be algorithm for system assessment of light climate on the workplace. System should be compatible with requirements of standards ISO 9000, 14000 and 18000.

Notes:

The lighting conditions in the Polish flats – surveys results

Elżbieta Janosik, Stanisław Marzec

Flats' lighting is the important factor which formed the life conditions. It is a question if the Polish society has not full consciousness about the role of the home lighting and has not knowledge how to illuminate home properly. In Institute of Occupational Medicine and Environmental Health in Sosnowiec, the studies were realized, based on the recognition of the real lighting conditions in Polish flats and estimation of inhabitants' knowledge about flats' lighting. The surveys studies were conducted, concerned the rooms description, a sort of using lighting, customary ways of lighting in particular places, the most often faults and problems with lighting installation, senses during work or relax by given light, subjective estimation of lighting role, the possibility of individual creation of the lighting in own home, and also knowledge and news' sources about flats' lighting. On the ground of obtained results it was determined in which way the contemporary Polish flats are illumined, if this lighting ensures the proper conditions of visual work, which faults are the most often, in which way the lighting conditions influence on the inhabitants' health and home-works, and also what is Polish society's consciousness, knowledge and treatment the problems of flats' lighting.

Notes:

Development of ceramic metal halide lamps with ultra lumen maintenance and reliability

Z. Tóth, T. Russell, T; Z. Kolozsi, Z, V. K. Josepovits

Lighting today is considered as a simple service in our every day's life. The increasing cost of the energy and of the maintenance, the need for environmentally friendly systems, the demand for reduction of energy usage, and hence the emission of greenhouse gases, makes the continues development of the existing and future light sources necessary. During these developments the light source manufacturers have to leverage the up-to-date materials and up-to-date material characterization methods as well as have to rely on widespread knowledge of the physical and chemical phenomena takes place during the operation of the lamp. The paper describes an investigation using such a method to reveal the early stages of the phenomena responsible for the lumen loss of Ceramic Metal Halide (CMH) lamps.

Notes:

CIE role in establishing best measurement practice for the development and testing in the field of and lighting, including novel luminaires and emerging lighting technologies

Marek Šmíd

The International Commission on Illumination is committed to worldwide cooperation and to the exchange of information on all matters relating to the science and art of light and lighting, colour and vision, photobiology and image technology. Since the year 1913, the CIE has become a professional organization and has been accepted as the leading authority on the subject, as such it is recognized by ISO as an international standardization body. The CIE has a long established role in developing measurement practices and basic standards of metrology in the fields of light and lighting. Its technical activities are carried out through several Divisions each covering one sector of light and lighting, each Division establishes Technical Committees (TCs) to carry out the technical programme of that Division. The recent rapid development has brought the novel luminaires and emerging lighting technologies into daily use. Applications of LEDs and OLEDs, along with other new technologies, have set challenging tasks for the CIE at the beginning of 21st century in order that these are constructed, characterized and applied in optimal way.

Notes:

Power Supplies for LED lighting

Gabor Schulcz

Introduction of LEDs as an electrical component. Supplying of LEDs from SELV, through resistor or analogue current source. Supplying through Switched Mode Current Source. Power supplies supplied with mains for LEDs with SELV function. Non-isolated power supplies. Dimming. Electromagnetic Compatibility (EMC), THD of mains current.

Notes:

Comparison of real street lighting with sodium lamps and LEDs

Marek Bálský, Rudolf Bayer

Abstract. The paper presents the comparison of luminous and electrical properties of modern LED-based luminaires with properties of the conventional luminaires with high pressure sodium lamp. It collects available product information of compared luminaires with measured luminous and electrical properties of them to allow a reader to take a view of mentioned luminaire properties. The most important values of the luminaire samples compared are the luminous efficacy, color rendering index, startup process characteristics, spectral distribution of the light sources, etc.

Notes:

Experimental investigation of the Purkinje effect in case of traditional and modern street lighting luminaires

F. Szabó, Z. Vas, P. Csuti, J. Schanda

This study investigates the scale of the Purkinje shift by using LED light sources at different CCTs. A red Munsell sample (2.5R 5/6) was selected as primary stimuli. A matching scale according to lightness has been constructed of blue Munsell chips (10B 2/6 – 5B 8/6). The primary stimuli and the scale were placed into a lighting booth. Two luminance levels were established with the help of a high pressure Sodium lamp, a metal halide lamp, a warm white and a cool white LED cluster: L=0.5 cd/m2 for mesopic and L=18 cd/m2 for photopic conditions. The task of the observer was to match the lightness of the primary colour patch with the members of the scale. Results showed that the matched scale element during mesopic conditions is at least 1 Munsell step darker, as the matched patch in case of photopic conditions. Currently, authors are working on the construction of a more detailed matching scale, to describe this effect more accurately in case of different SPDs. These results can help LED street lighting luminaire manufacturers by deciding the correlated colour temperature of the best suitable LEDs to use in their luminaires.

Notes:

Energy demandingness of lighting systems

Jiří Habel, Petr Žák

For many years, attention has been paid to the energy conservation issues, not only in the area of lighting but also in a number of other fields. Launching a discussion about global warming meant a significant moment of this issue´s solution process. One of the consequences of this discussion is the increasing pressure to accelerate the introduction of new technologies, procedures as well as legislation, which all lead to reducing of energy demandingness in outdoor and indoor lighting systems. The report is dedicated to the relationship between technical parameters and energetic demandingness of the lighting and describes possible directions in search of energetically efficient lighting systems.

Notes:

The collection and recycling system of Lighting Equipment in Hungary

Béla Kovács

Abstract. The following paper gives an overview of Electro-Coord Hungary collective lamp waste management. The paper describes the cooperation and cooperation partners of Electro-Coord: The Electrical Network Service Companies, the lamp waste collection and recycling and the long term targets.

Notes:

Development of standardized algorithm and code for roadlighting calculations

Gašparovský, D., Bagačka, R., Janiga, P.

Roadlighting calculations are basically defined by european norms of the EN 13201 group (for practical application), however, based on methodology described by the Publication CIE 140. This document substitutes on older version published in CIE 30.2, with only minor modifications. In previous publication, besides methodology itself, also a source code written in Fortran language has been introduced, what is not applicable today. Such code could not be handled in the newer CIE 140 publication from lack of time and technical reasons. Comparative analysis of up-to-date software tools performed on 7 different lighting situations showed significant differences in results in spite of fact that common methodology has been implemented. Therefore a conclusion has been drawn that it is also important to standardize the algorithmisation of the methodology as with CIE 30.2. New source code in the C++ language is recently under preparation. After final compilation this code should provide commercial software developers a library with all necessary functions, including calculation of quantitative parameters (average, uniformities etc.). Compact calculation core will be free of any user environment, independent on platform and it will feature particular citation of formulas, expressions, figures or chapters related to the CIE 140 document. This paper aims to inform about the state-of-the-art in the current works and success of the code preparation. It is expected that the code should complete the revised CIE 140 document as its organic part.

Notes:

Analysis of measurement and evaluation of colorimetry sky types

Anton Rusnák

The current methodology for measuring the sunlight is focused on measuring light technical parameters, most illuminance, sunshine, irradiance etc. Introduction sky types brought to the evaluation system of representative sky, colorimetric properties are not examined. The contribution will be given theoretical assumptions colorimetry measurements sky types and their evaluation. Presented will be the effects of colorimetry sky types of rhythms man events and mentioned are also the current software programs for determining the colorimetric properties sky types.

Notes:

Colored lights in nature

Klara WENZEL

Abstract. The Earth is often called the blue planet. Indeed, satellite pictures and aerial photographs are dominated by the blue color of the oceans that cover over 70 per cent of Earths's surface. On these pictures the sky looks blue, whereas in pictures taken on the ground the sky is blue. However, different plants, flowers, birds, fish, and butterflies display all the colors of the rainbow – even more that that, in fact. In general, blue seems to dominate the inanimate world, whereas living beings exhibit a very broad range of colors. In my talk I examine those laws of physics and biology that bring about the colorfulness of the terrestrial environment.

Notes:

To See or Not to See – Reflections on Human Color Perception

Dariusz SAWICKI

We all know many spectacular optical illusions where visually perceived images differ from objective reality. The pictures are gathered by the eye, and then processed by the brain and the unconscious inferences change information that reaches our consciousness. The question arises if the same situation can occur in color vision and interpretation. It is essential question in Lighting Technology, Human Computer Interaction and Computer Graphics. To answer this question the whole perception process is analyzed in the paper. The color information can be falsified at everyone stage of perception process. In many cases it is useful for us but often does not allow obtaining information about true color. But what is really true: the measured color or our "real subjective" perception?

Notes:

The influence of environmental conditions on work of the LED luminaries

Wiesława Pabjańczyk, Przemysław Markiewicz, Roman Sikora, Zbigniew Gabryjelski

In the LED luminaires data which are available by manufacturers and importers is lack of information relating the influence of environmental conditions and in particularly of ambient temperature on photometric and electrical parameters. From this regard the investigation of ambient temperature influence on the value of light flux and light efficiency was take into consideration. The main aim of these investigations were estimation the parameters of LED luminaires in the real maintenance conditions. It is the most important for an investors and users. In the paper the results of laboratory researches of selected and available LED luminaires were presented. These researches will be make with using the climatic chamber in the wide range of temperatures between -20°C and 100°C. The aim of these researches is estimate of influence ambient temperature on the value of light flux. Moreover the subject of researches will be analysis of stabilization process of light flux in time function when the luminaires is switch on from “cold state” or “warm state”. The evaluation of working conditions will be light efficiency because of this parameter is characterized for devices energy efficiency. The measurements of LED luminaires temperature will make by using of the thermovision camera, which give possibility make versatile analysis and visualization considerate phenomena’s.

Notes:

Effect of directional reflectance in lighting

Jan Škoda, Petr Baxant

The article describes the influence of directional reflectance of the lighting calculations. Compares the difference between the calculations of materials ideally diffuse and real materials. For real indicatrix of materials is reflected in the reflected light and the reflecting of materials is already behaving as an omni Diffuser, but under certain angles, begins to behave almost like a mirror. This contributes to an erroneous calculation of illumination, since the relevant computer programs allow for real reflective materials as ideal. This error has resulted in unnecessary over lighting certain places, and ultimately pointless waste of electricity or opposites low dimensioned illuminance level.

Notes:

Contribution to the luminance distribution in an office during daytime

Stanislav Darula, Richard Kittler

Energy saving requirements for the performance of buildings together with the need to create a healthy indoor environment are main tasks of illuminating and building engineers. Because the daylight in exterior is continually changing also permanent changes of illumination in the interiors for work and rest can be expected. Daylight penetrates through apertures into interiors resulting in only a part of available daylight is used for illumination. In dependence on the exterior situation and window orientation daylighting in two same rooms can differ. Currently the daylighting in the buildings is evaluated in accordance with CIE overcast sky conditions but under these conditions daylight changes are not considered. In the side lit rooms luminance distribution during daytime depend on the size and position of windows in the facade, on optical properties of inner surfaces and on sky luminance distributions seen from the work place. When sunrays are not penetrating in the room, only small changes of luminances can occur with the distance from window wall to the deeper space. In case of the sunray penetration the values and position luminance patches on walls and floor are changing during day. For an evaluation of luminance distribution in the interiors can be used several computer programs. It seems that specialists can calculate by various programs but only under overcast, clear and intermediate skies, the latter is not existent in reality. To use daylight better it is useful to know the indoor luminance changes. The luminances in the typical office at ICA SAS Bratislava were measured by CCD image method. These data were compared with the results calculated by Dialux program. This contribution will present possibilities of the application of the CCD image method for luminance evaluation and the predetermination of interior luminance patterns.

Notes:

LED module

Luděk Hladký, Libor Štědroň

Abstract. LED modules are aimed for general interior and exterior lighting with the advantages of LED technology whereas they considerably facilitate implementation of LED into the traditional technology of lighting fixtures production. The lighting fixture equipped with LED module is still subjected to the certain challenges in the design of thermal management and optical system. Properly designed cooler ensures the guaranteed lifetime and properly designed reflector enables higher efficiency of optical system in comparison with conventional technology. Aim of the article is to present the Philips LED modules and its applications.

Notes:

Anomalies of the correlated color temperature

Péter Csuti, Balázs Kránicz

The correlated color temperature is an important quantity of lighting technique. By this chromaticity of light sources can be represented. Its definition originates from the CIE-uv chromaticity diagram which is now obsolete. This concept has been invented to describe whether a given light source is perceived yellowish, white or bluish. However, from computer experiments it turned out that the concept of correlated color temperature has some anomalies; hence it can happen that observers set up a reverse order compared to that shown by correlated color temperature values. In the paper these anomalies are discussed and a method is introduced by which they can be eliminated.

Notes:

Cooling system of HP LED with a Peltier module – laboratory equipment

Przemysław Skrzypczak, Konrad Domke

Abstract. The paper will describe the structure of laboratory equipment used to specify temperatures of all parts of the cooling system. This system with a Peltier module is designed for keeping the minimum temperature of HP LED. Directions of heat flow in ideal and real systems with their electrical and heat equivalents will be presented. It will make temperature measurements of ambience and sink, warm and cold sides of the Peltier module and solder of the HP LED. Because of the large time-constant, measurements will be automated with the help of programmable power supply, digital multimeters and temperature recorder. Calculations with measurement results will allow verification of the applied model.

Notes:

Optimization of Rotationally Symmetrical Mirror Reflector Profile

Krzysztof Wandachowicz, Giulio Antonutto

The task involved in luminaire calculation usually consists of determining the luminous intensity distribution or luminance distribution on the surface of optical elements for the assumed luminaire model. However, the problem can also be approached from a different angle. Assuming a certain desirable luminous intensity distribution, an attempt can be made to find such a reflector shape that will ensure the achievement of preset assumptions. The task at hand then becomes a problem of optimization, aimed at determining the best solution (e.g. identification of the optimum reflector shape) from the viewpoint of a specific criterion (e.g. preset luminous intensity distribution). The paper consists description of original technique of optimization mirror reflector profile using ray tracing method.

Notes:

Aspects of measurement and transfer of refraction of light through light guide diffuser

Marek Krasňan, Alfonz Smola

In modeling the transition of light through the hollow light guides and all their components, it is necessary to replace the corresponding rays of the sun with rays from artificial light sources. If we consider the distance of the Sun from the Earth and its dimensions, the rays hitting the Earth can be considered as collimated - parallel. Transfer the beam through a diffuser depends on the angle of the beam on the sample surface, the structure of the sample material and its thickness. Clear glass has the property that the impact of the beam perpendicular to the surface passes through the material unchanged. The impact of the beam at an angle arises in the glass refraction, while the output of the beam material is parallel to the incident beam. The sense of this contribution will examine the transition of light rays through the diffuser and setting conditions for measurements of light transmission.

Notes:

Use luminance analysis for assessing the energy performance of lighting

Petr Baxant, Tomáš Pavelka, Jan Škoda

Purpose of this paper is to discuss the possibilities of using luminance analysis for purposes of measuring the energy demand of lighting systems especially in the context of assessing the luminous efficacy of installed light sources, respectively efficiency of installed lighting fixtures without a need to disassembly. In assessing the energy demand there are usually considered the values of the installed power for lighting systems in the building, e.g. as per unit area. In order to assess the effectiveness of existing fixtures, we have to dismantle them and verify their effectiveness in laboratory, which is obviously tedious and practically impossible. However, it would be possible, e.g. with a luminance analysis of luminaire or light source, to evaluate the approximate luminous flux and thus make the basic idea of efficiency, respectively luminous efficacy. This is of course not possible with any luminaire or source, but with some types, this should be feasible without problems, especially for ideal diffuse surfaces. With what accuracy it is possible to determine the luminous efficacy in this way, should answer this paper.

Notes:

Comparison of the current light sources lifetimes

Tomáš Pavelka, Petr Baxant

This paper aims to assess and compare lifetimes and parameters of light sources, as they are presented in the professional literature and also by the producers. These values often don't match and there are some values, especially those presented by producers, which are rather theoretical and they haven't been yet practically verified. Within the research in this area we intend to realize several experiments, which should provide further knowledge about light sources lifetime from different perspectives. Another important factor, which may be related also to lifetime, is a modification of light quantity parameters during the indicated lifetime of light sources and also the influences, that affect these parameters. With this phenomenon, we want to deal in the paper too. We assume, that the paper will be mostly the literature search of yet published information with a view to suggest other ways of research, that should be made shortly.

Notes:

Possible use of power LEDs for lighting and communication

Jan Látal, Petr Koudelka, Vladimír Vašinek, František Dostál, Karel Sokanský

The authors focused on the possibility of using the power LED not only as a light source, but also as a communication tool, in the article. The theoretical reasoning for the use of high power LED lighting gradually dismantled and are then discussed options for communication. LED for power circuit is designed to generate a pulse with modulation On-Off Keying (OOK). The article charts suggest expressing spectral and radiation characteristics for the construction of such circuits using power LED lighting and also for communication.

Notes:

Environmentalism in the public lighting

Tomáš Maixner

In recent years the environmental campaigners have used the method of El Alamo. It is a very dangerous weapon. Public has the impression that there are many experts who oppose the so-called "Light pollution". In fact, all of them copy from one or two ideological leaders. The real experts have hardly any chances to appear in public. There is a danger that pseudo-ecologists will achieve their goals. As a result can be limited not only public lighting, but all kinds of outdoor lighting too. In 2009 in the Czech Republic and in Poland was declared a "Area of darkness". This article refers to methods of the environmental activists as well as to the first negative impact of this area.

Notes:

Lighting on pedestrian crossing

Tomáš Maixner, Jiří Skála

In literature can be read some information about the lighting of pedestrian crossings issue. It seems to us that to talk about pedestrian crossings lighting is a bit unsuitable. Emphasis is not focused on the pedestrians, but on the pedestrian crossing. No wonder that the designer or PL operator puts up with the fact that the zebra crossing is lit much more than the road. But the main point is to illuminate pedestrians on the road to protect them. Therefore it is necessary to lit (or do not lit in the event of a negative contrast) the area, so that the pedestrian would be safety recognizable. Because of that it should be considered properly the issue of lighting of pedestrians on the zebra crossings and not to illuminate only pedestrian crossings themselves. The article presents new points of view in this area.

Notes:

Reality LED

Tomáš Maixner, Jiří Skála

In Prague there is proceeding a huge experiment with LED in the public lighting. This experiment monitors operational characteristics of this advanced technology, their failure rate, dependence on the technical characteristics, depending on the season, way of operation and pollution impact. The article shows the first results of this experiment. Furthermore, the article is deal with the results of using poor-quality LED luminaires that are in the current market. The author had the opportunity to judge several LED public lighting systems from the authorized expert point of view. Some of them were literally life-threatening.

Notes:

Comparison of real street lighting with sodium lamps and LEDs

Petr Žák, Jiří Habel, Jiří Plch

Light emitting diodes are one of the fastest growing areas of the lighting technique. One application area where the LEDs are beginning to apply is the street lighting. Today's situation on the market of LED fixtures for street lighting is characterized by a wide range of qualitative levels. The article aims to contribute to the evaluation of the current state and provides a comparison of the results of measurements and calculations of real street lighting systems with high pressure sodium lamps and LEDs. The proposed lighting has been implemented within the pilot project in Písek in Zborovská street.

Notes:

Measurement of obtrusive light in terms of Czech Republic

Tomáš Novák, Karel Sokanský, Petr Závada

Obtrusive light (light pollution) refers to both the night sky luminance as well as any light that radiates to the places where it is not required. Moreover, this kind of light increases the energy losses. The measurements are done for the purpose of obtaining information about night sky luminance at different meteorological situations and in different locations. We want to know influence of the artificial light sources on the night sky luminance. Outputs from the measurements are used to verify the physical model of the night sky. The aim of this model is to find out how the artificial light sources (public lighting, or whole cities) are capable to influence the sky luminance at different distances and under different meteorological conditions. The future of this model is to compare influences of the new artificial outdoor lighting systems to the night sky luminance in the project phase.

Notes:

Research of power LEDs for mobile communication

Petr Koudelka, Jan Látal, Vladimír Vašinek, František Dostál, Karel Sokanský

The autor's research team focused on the power LEDs for use in mobile communicationd with an emphasison the automotive industry, or communication type Car to Car (C2C) and car to Infrastructure (C2I) in thi article.The idea of using power LEDs as the next development direction lights for car, which owing to its properties can significantly increase the safety on the road is outlined here.

Notes:

Instrumentation for long term measuring of parameters under night sky

Tomáš Novák, Petr Závada, Karel Sokanský

The paper deals with equipment for long-term measurement. We want to collect information about night sky, quantify the obtrusive light and compare the level of it in industrial and habited areas and out of them. For long-term measurements of low level illuminance (about 10-3 lx) and luminance (about 10-3 cd/m2) should be applied not only the measuring equipments with high sensitivity, but also completely independent one with the ability to save the measured data.

Notes:

Hybrid power system of public lighting in smaller villages

Stanislav Mišák, Jaroslav Šnobl, František Dostál, Daniel Diviš

This article deals with the possibility of public lighting power from renewable energy sources, and a hybrid system consisting of solar panels and wind power. Specific data for dimensioning the system was obtained extensive exploration of the state and consumption of public lighting in the villages of the Czech Republic. In this paper contains an economic reasoning and analysis, and investment costs compared to cable distribution.

Notes:

Diagram of daily consumption of electricity, houses appliances, distribution them into categories by importance of electricity supply

Petr Závada, Karel Sokanský

Today, the development of power generation from renewable sources is an effort to maximize the share of total energy consumption. Big source of energy in solar and wind power plants are mostly connected to the distribution network and supply the energy only if it produces (solar power station produced during the day and wind power station produced when is a wind acceptable). For this reason, the energy from these sources are not available for all day and must be taken from other power station (atomic power plant, coal-fired power plant). Our project is designed the source of power which is combined solar power plane, wind power plane and batteries so that electrical energy will be supplied during the all day. The article deals with the study of power consumption of electricity of family house. These houses can be in less occupied areas with their own heating systems. Next step is distribution of household appliances into several categories by the most importance electrical power supplying.

Notes:

Calculation methods and programs for daylight lighting and comparison of their use

Martina Zapletalová, Jiří Novák

Abstract. Lighting status of an interior and effect of lighting on humans and their eyes does not depend solely on the amount of light, but also on other factors (spatial distribution of light, the dynamics of changes of lighting with time etc.). The design must maintain good lighting quality in case of sunny, cloudy and overcast sky, and also in case of direct illumination by the Solar. To maintain good lighting quality, sufficient lighting level does not suffice; it is also necessary to maintain good lighting quality. The article below presents a short analysis of evaluation of daylight lighting and related calculation programs, their possibilities and possible uses.

Notes:

The Sports Park Stožice in capital city of Slovenia

Aleš Kaňa

The Sports Park Stožice in capital city of Slovenia – Ljublania integrates a football stadium and a multi-purpose sports hall with a big shopping centre, covered by the artificial landscape of the recreational park. As a result 182,000sqm Sports Park Stožice becomes one of the major focal points of Ljubljana's urban life, attracting people of different interests and generation both during the daytime and in the evenings. Nowday is running final work in this stadium. THORN company realized both properties. In this poster will be described some important requirements of illumination and global solution of football stadium (which is finnished now). Luminaries were choisen to not glared players and people in platform. But primarily, the luminaries can have differnt levels of illuminance and vertical illuminance, which is important for good telecast of football matches.

Notes:

Taking Control of Your HID Lighting

Peter Jones, Clive Riddell

Ventronic electronic control gear lets you take control of your HID lighting. The new Ventronic offers numerous methods for dimming Metal Halide lamps including Wi-Fi, using 802.11b wireless networks. Provides superior light quality with increased lumen maintenance and increased lamp life over a wide range of supply voltages; optimized energy savings through excellent efficiency over the full dimming range.

Notes:

Different methods of the maintenance factor setting

Pavel Stupka

This article deals with an issue of the maintenance factor setting. The article tries to refer differences in projects and measurements that are caused by the maintenance factor choosing.

Notes:

Glassed-in offices with PC in terms of environmental factors

Zuzana Mathauserová, Jana Lepší

Presently is still rising count of office buildings with glassed-in skin. This article shows these kind of buildings from the point of view a employee who works with the computer. In terms of lighting are these places understood as long-term residence with challenging visual activity. Daylight in buildings with glassed-in skin is necessary to solve as a compromise between the daylight need and power demands for the thermal regulation.

Notes:

Methodology for measuring the sunlight

Anton Rusnák

The current methodology for measuring the sunlight is focused on measuring light technical parameters, most illuminance, sunshine, irradiance etc. Introduction daylight types brought to the evaluation system of representative sky, colorimetric properties are not examined. The contribution will be given theoretical assumptions colorimetry measurements daylight types and their evaluation. Presented will be the effects of colorimetry daylight types of rhythms man events and mentioned are also the current software programs for determining the colorimetric properties daylight types.

Notes:

Deformation of the photometric characteristics of luminaires due to pollution of environment

Gašparovský, D., Mácha, M.

One of the crucial parts of lighting system design is determination of a suitable maintenance factor (MF). Methodical guide how to estimate MF is described in the CIE 97 Publication, also cited in the standard for illumination of workplaces in interiors – EN 12464-1. Maintenance factor consist of several components. One of them, belonging to the group of recoverable (or partially recoverable) light losses is factor considering the luminous flux loss due to dirt on luminaires, determination of which among others also depends on cleaness of environment in which luminaires are installed, within three possible categories. The CIE document, however, does not give any guidance or definition of these categories, just examples of rooms. Thus, practical application of the document meets some difficulties. The paper brings to the public philisophy of recent works in research of the maintenance factor. Main goals of the investigation consist of exact definitions of cleaness categories, research of the impact of dirt to various optical parts of luminaires – not only from the light-loss point-of-view but also what concerns the deformation of photometric characteristics of dirty luminaires, namely the LIDC.

Notes:

Visual quality in working spaces with entirely diffuse daylight – measurements vs. simulation

Dariusz Heim, Eliza Szczepańska

Translucent materials are very attractive, alternate solutions for designers to provide daylight in building space. The main advantages are related to better thermal insulation. Translucent elements made from glass or plastic can be easily combined with transparent insulations improves energy balance between building and external environment. Simultaneously, spaces with diffuse daylight are free of the illumination contrasts, especially for elevation with direct solar beams. On the other hand, diffuse elements can not be treated as a solar protection system and could be considered individually due to building type and function. The study presented in this paper is devoted to analyzed visual comfort in working space of existing, new office building. The south wall of the room is fully covered by vertical glass panes. Diffuse light transmission is about 70% and thermal insulation at the level of 1.8 W/(m^2K). The unique character of working place is that several types of work is going to be done during the day. They are reading, writing and working with computer. Additionally any control devices are install to stimulate internal lighting conditions. It means that one solution should provide proper conditions for all types of activity and all weather conditions. The analysis are based on measurements done for sunny and cloudy days together with computer simulation. The 3D model were created using Radiance. The results obtained for different scenario in several working places show the effect of diffuse light on visual comfort. Additionally, some simulation were done to compared existing state with alternate solutions based on different type of the glass.

Notes:

The possibility of regulation luminous flux of metalhalide lamps

Andrzej Wiśniewski

The light managements systems for HID lamps are using more and more often in interior and exterior lighting. There are new electronic ballasts for metalhalide lamps witch dimming option in the market. The paper will be show measurements of light spectral distribution given by metalhalide lamps in dimming phases. On the base of measurement will be calculated changing of colour rendering index and colour temperature of light in function of luminous flux value.

Notes:

TWO-DIMENSIONAL VISUALIZATION OF RETROREFLECTION COEFFICIENTS (CIL)

Tomasz Targosiński

Requirements for retroreflection coefficients are normalized for small number of given values of illumination and perception angles. Measurements are performed in similar way. Real visibility in night drive condition of retroreflective materials depends on two dimensional distribution of CIL in all range of illumination and observation angles and change continuously during road condition observations. In paper is described new method and device which allow assessing two-dimensional distribution of CIL for retroreflective materials used in practice as well as examples of real CIL distributions.

Notes:

The spectrum analysis of the usefulness of the light sources for building the sun simulators

Konrad Domke, Joanna Ratajczak

Summary – The paper will present the spectrum analysis of different light sources. The comparison of this spectrums with the spectrum of solar radiation after passing the atmosphere will be made. The paper will present the requirements contained in norms for building the sun simulators both for collectors and PV cells modules examination. The existing sun simulators and restrictions of the sun simulators resulting from construction and materials of the examined elements will be described. Also the comparison of existing guidelines for building the sun simulators witch existing sun simulators will be presented in this paper. Also the usefulness of the discussed light sources for building the sun simulators will be put on consideration.

Notes:

Luminance distribution of LED luminous surface

Dariusz Czyżewski

Independent on application, in design process of optical elements for LEDs information about luminance distribution on a light source surface is crucial. The problem consists in straightforward evaluation of LED luminous surface, that is whether the light source is only LED matrix or primary optical system, or often used secondary optical system. Additional problem is connected with different shapes of optical systems that directly influences luminous intensity distributions. The investigations initiated should give answers for some problems.

Notes:

Monitoring of road lighting conditions illuminated with the use of LED luminaries

Dariusz Czyżewski

The concept of LED use in road lighting is new and not widely known. On the lighting market many LED luminaire constructions have appeared. Lighting parameters given by the manufacturers (distributors) are questionable. Moreover, there are no many practical solutions of road lighting with the use of LED luminaires. There is lack of experience showing how such LED luminaires work in real conditions. It was decided to monitor road lighting conditions on one of the Warsaw streets where LED luminaires had been installed. In this paper the report of monitoring will be presented.

Notes:

LED's spectral power distribution under different condition of ambient temperature and driving current

Irena Fryc

The quality of light emitted by LEDs depends on many factors. The most significant are ambient temperature and driving current. In lighting application the most important is to have light with constant luminous flux and color output. In this paper we will present some data taken from measurement of commercially available LEDs. Based on those data we will try to answer the question about possibility for having LED light output with constant luminous flux and color when LED is under different ambient temperature.

Notes:

Matching algoritms during analysis of medical imaging parameters: possibilities and constrains

Grażyna Gilewska

The methods of medical obiects imaging will be presented in this article using the enamel structure. Examined images were analysed by context, gradients filters and morphological transformations. Main limitations were unequivocal separation structures of image and measurement their geometric parameters without redundancy components. To decrease this limits used programmable logical systems FPGA.

Notes:

A comparison of PWM driving and DC driving of LEDs lamp

Marian Gilewski

This paper describes a comparison eficiency between pulsed and DC LED drivers. An influence components on energy eficiency of drivers are made. The measurement results of typical circuits DC and pulse drivers are presented. Nowadays a large majority of adjustable LED pulse drivers are PWM based circuits. It gives variable pulse width of light. This light is hard to measurement and application in many fields. DC control of LEDs light is more complex but sometimes it not has competition.

Notes:

The stabilizing of RGB LED colour with constant-current driving

Lech Grodzki

Control circuit of RGB LED display should allow stabilise the colour of emitted light in different working conditions. This task can be achieved by changing the currents in the RGB LED components. The working conditions, which have an influence on the work of LED among other are: ambient temperature and illumination around the device. The changes of the mentioned physical quantities can cause the change of colour (temperature) else the change of contrast between the lighting diode and its surrounding surface (external illumination). The article presents the properties of selected integrated circuits from Texas Instruments designed to LED control. These IC's in collaboration with microcontroller allow compensate disadvantageous changes of working conditions. The paper also contains the conclusions about applicability of presented solutions.

Notes:

A multichannel DC control of power LEDs

Marian Gilewski

In this work is described an idea of DC multichannel driver of power LEDs. The main point of the solution is digital control method of LED constant current. LEDs current can be adjustable from 100 mA to 1000 mA of every channel. A scheme of realization the driver and the design recommendations are included too. At the final part a results of laboratory tests are shown. This solution can be an alternative to PWM based drivers in many fields of LEDs applications.

Notes:

LED group driving

Lech Grodzki

In some LED applications the parallel, identical driving of each device in the group of the diodes are necessary. Examples of such applications are: display back-lighting, traffic lights, car dashboards, automotive LED lighting. Using many, even unified controlling circuits increases the total cost and overall dimensions, and decreases operational reliability. So, the solutions of simultaneous driving of group of the LED devices, should be taken into account. The article presents an example of integrated circuit designed for controlling the currents in some of LED devices. The paper contains the results of carried out experiments. Additional features of IC, achieved in connection with microcontroller, are also presented. Reader can also find the propositions of application in automotive intelligent lighting system.

Notes:

More light on the road – tests of passing lights with modern halogen filament lamps

Piotr Kaźmierczak, Małgorzata Kalisz

Passing lights in vehicle headlamps serve two opposite tasks: they should ensure the best road illumination, and on the other hand they should not dazzle oncoming drivers. It would seem that limits for halogen filament lamps imposed by normative documents, concerning emitted luminous flux and filament geometry, make the current technical possibilities for passing lights equipped with this kind of light sources to reach their end. Meanwhile, we can buy at in the stores halogen filament lamps giving “more light on the road”, sometimes even 90% more. This paper will present passing lights illuminance measurement results of typical headlamps design (headlamp with parabolic reflector and striped lens, free form reflector with plain lens and elliptical lens reflector with plain lens) equipped with selected, currently manufactured halogen filament lamps. This allowed to verify the influence of the offered filaments’ design solutions on the road illumination, in comparison with the standard halogen filament lamps.

Notes:

The latest designs of illumination worked out in Lighting Division of Warsaw University of Technology

Rafał Krupiński

Planning the illumination of the objects is not an easy task because of its complexity. Apart from purely technical imagination and following the rules and methods of illuminating one should take into account esthetical regards. Anticipating the final effect is very difficult; often impossible because of the huge size of the building and the number of the equipment applied and installation possibilities. Three dimensional computer graphics can find its useful application here. The Lighting Division has specialised in creating illumination designs with its help and brought the school of illumination design to life .Since 1996 in Institut has created over 100 projects, besides the thesis and scientific papers. The majority of them has been already realised. The author presents a few projects including the procedure of planning the illumination with the assistance of computersimulation of a 3D geometrical model.

Notes:

The calibration of the tristimulus colorimeters

Łukasz Litwiniuk

In this paper the problems of calibration of the tristimulus colorimeters to the measurement of chromacity of light sources were described. Two exemplary tristimulus colorimeters were presented. The algorithm of the adjustment and calibration in the point of adjustment was described. The calibration uncertainty was analyzed.

Notes:

Concpet of application of variable lighting surface in vehicle signalling lamps

Wojciech Moćko

Present regulations allow using vehicle signaling lamps with variable levels of intensity. It gives better contrast and visibility than one level intensity lamp. Regulation is made by proportional changes of lighting intensity of all particular light sources in lamp. This article describes idea of rear signaling lamp which is able to fluently change luminance and additionally size of lighting surface. It impacts on improvement of signal visibility and drivers visual performance.

Notes:

Approximation by fractional power model of measured spectroradiometric data type

Dorota Mozyrska, Irena Fryc

In the paper results of approximation for spectroradiometric data type by fractional power model. Investigations of parameters, fractional power, independently on the interval of the length of lambda is going to be discussed. The uncertainty of measured values will be considered by using the weighted approximation for power models.

Notes:

The influence of LED luminaires on supply network

Wiesława Pabjańczyk, Przemysław Markiewicz, Roman Sikora, Zbigniew Gabryjelski

Observed at present the development of LED production technology together with them the growing efficiency as well as diminishing cost, causes that they become the alternative light sources both in internal and external lighting. LED diodes are supply from power network across specialized electronic feeders, which can treat as non - linear loads generating distortions to supply network. The large quantity of applied LED luminaires can contribute to deterioration of the electrical power quality in the lighting installations. In the paper the results of measurements selected LED luminaires accessible on market were presented. The measurements were make by using of power quality analyzer TOPAS 1000. Moreover will make analysis of the influence LED luminaires group on level generating distortion by these luminaires.

Notes:

Estimation of equivalence colour contrast and luminance within illumination

Michał Pawlaczyk

Colour illumination can be spotted more and more frequently nowadays. This report shows methods of obtaining colour illumination and the results of our experiments concerning the possibility of transferring white light into colour light as well as possible benefits of equivalence of colour contrast and illumination. The report also proves how few respondents are in favour of colour illumination, thus showing preference for white light used to illuminate objects.

Notes:

LED luminaire with adjustable colour temperature and luminous flux

Andrzej Pawlak, Krzysztof Zaremba

Recently, we have been observing very dynamic evolution of LED diodes. They are used currently not only in simple signaling devices but find their application in increasing number of luminaries. High power LED diodes (1÷5 W), characterized by luminous flux at average level 100 lm are applied for lightning purposes. Such LED diodes are currently available on the market. However, such high power diodes have numerous parameters which are significantly different when compared with their low power equivalents (100 mW). All higher power diodes (3 and 5 W) have luminous intensity curves resembling closely Lambertian (cosine) distribution. It must be noted that such luminous intensity distribution is highly unsuitable when it comes to its capability to produce uniform lightning for the target work area as well as limiting the glare effect for users. It must be taken into consideration that high power LED diodes are typically point light sources with luminance values ranging from 1 Mcd/m^2 to 10 Mcd/m^2, which is comparable with the light bulb filament. Due to their aforementioned property, such diodes might be used for general lightning purposes and especially for illuminating areas with computer monitors only when equipped with properly designed luminaries with correctly chosen optical system. This work presents results of light measurements made on a model of luminaire designed for illuminating work area especially with computer monitors. Twelve LED diodes type K2 in star version made by Lumileds with adequate lenses with elliptical pattern of light distribution were used in this luminaire as a light source. Half of them has cool temperature (daylight) and half – intermediate (cool-white). Each group of LED diodes can be adjusted independently. The advantage of this luminaire is fluent regulation of illuminance level at the work place up to 4500 lx (from the distance of 1 m), as well as smooth adjustment of colour temperature from 3800 K to 4800 K. Achieving such high level of illuminance and adjustment of colour temperature was possible due to the implementation of high power LED diodes. Up to now regulation of colour temperature was possible only in luminaire with fluorescent lamps, but illuminance levels were significantly lower. The luminance will be used for preferences investigation of people with poor eyesight regarding lighting levels of work place and colour temperature.

Notes:

The comparative analysis of road lighting energy efficiency

Piotr Pracki

It is reasonable to design and maintain road lighting effectively. In this paper the comparative analysis of energy efficiency for road lighting was conducted. The needs for visual performance and comfort were included in the analysis. Energy efficiency was analysed taking into account variance of lighting energy efficiency parameters: system luminous efficacy: light source-ballast, luminous intensity and light output ratio of luminaires, luminaires layout, maintenance factor, reflection properties of road surface and operation time of installation.

Notes:

The Simple Model of Diffraction Grating

Łukasz Stelmach, Dariusz Sawicki

In this paper we present a model of a diffraction grating for use in lighting technology and computer graphics. Although some successful attempts in this field have been made before, we believe that thanks to our approach the presented model is more efficient while still usable for many applications. In spite of its simplicity it's capable of modelling diffraction of colourful light emitted by a source describe either by its spectrum distribution or tristimulus RGB values which makes it suitable for integration with present rendering systems based on tristimulus model of a light source. We were able to achieve high efficiency because the geometry dependent calculations are based mostly on the ray theory rather than wave theory of light. Since only few parameters are required to describe properties of a diffractive surface in our model, it is possible to create spatial maps of those properties as bit mapped images and thus to render an image similar to a dot-matrix hologram.

Notes:

Spherical Harmonics: the New Algorithm of the Light Point Figure Simulation

Dariusz Sawicki

The Light Point Figure (LPF) depends on observer position and on all optical elements of the headlight: geometrical and reflective parameters of the reflector and the source of light and its emissive parameters. The most important algorithms for LPF determining are based on the ray tracing method. There exist some successful attempts of the functional separation of the emission from the observation. In spite of such solution, it is very difficult to take into consideration the area light source and real reflective properties in the simple calculation. In this paper the new method of the LPF determination is presented. The mathematical generalization of the reflection using spherical harmonics is used. The new solution allows simplifying the calculation process in some cases. It allows distinguishing the preprocessing part of algorithm and after that allows representing part of LPF determination as the operation on a vectors of coefficients.

Notes:

The dynamic mapping of luminance in analytical model of light source – the study results

Sebastian Słomiński

Primary calculation analysis of luminaires simplified model of the light source to a point. Making the light source models which take into account the real shape and the size of the light source (similar to real, described by the cuboids, cylinders, etc.- with the constant luminance on the whole surface) was a big progress. Natural step forward is to take into account the whole complexity of light sources shapes with real luminance distribution on their surface. In the paper the results of researches and issues connected with the mathematical modeling of the real light sources, basing on data from the matrix measurer of the luminance will be introduced.

Notes:

Photometric calibrator

Dorota Sobotko, Grzegorz Szajna

In the paper the photometric calibrator KF-10 produced by Sonopan was described. The construction of calibrator and basic metrological characteristics were presented. The problems with using calibrator in photometric measurements, especially in relating to requirements of point 5.5.10 of standard ISO/IEC 17025 were discussed.

Notes:

Calibration of tristimulus colorimeters

Grzegorz Szajna

The paper deals with issues involved in calibration of tristimulus colorimeters used to the measurement of chromacity of light sources. Two examples of tristimulus colorimeters have been presented. An algorithm for adjustment and calibration at adjustment point has been described. Calibration uncertainty has been analyzed.

Notes:

Photometric and radiometric measurements in Photometry and Radiometry Laboratory Central Office of Measures

Grzegorz Szajna

Tasks and activity of photometry and radiometry laboratory were discussed. The measuring traceability and range of international comparisons organized by EURAMET were presented.

Notes:

The concept for the RYGB LED lumia

Zbigniew Turlej, S. Abramik, E. Lisak, W. Władziński

The main reason for undertaking this study was the idea to use decorative luminaries to make the daily life experience of the surrounding more interesting and enjoyable. Having such visual environment it not seen as a luxury but as a basic psychological and physiological need which has its roots in the nature of human beings. Lumia is an art form that permits visual artists to play images in the way that musicals play with sounds. Though the concept of creating lumia has a long historical tradition, modern RYGB LED systems make it possible to design luminaries for creating lumia effects that are more flexible and easier to play than at any previous time in the history of art. In designing and playing lumia, three principal dimensions require attention: color, form, and motion. They have formulated principles for using them to achieve particular emotional effects. The paper describes some lumia effects of the segmented square luminaire with controlled RYGB LEDs.

Notes:

Energy's efficiency and economic aspects in road Lighting

Małgorzata Zalesińska

Road lighting is very important factor having immediate influence on comfort and safety of traffic. Correctly projected and executed lighting should ensure proper conditions of vision for all its users by realization of basic lighting requirements. For the sake of environment protection necessity became endeavour to saving of energy. This aspiration can be realized among other things as a result of improvement energy efficiency carry out of investment. In road lighting main factors having influence on energy efficiency are: parameters of light points, value of maintenance factor and maintenance procedures, kind used of road surfaces, location of light points in relation to road. Intended effect of lighting can be obtained of different solutions of lighting system. That's way every project investment should be put to economic analysis. In economic analysis should be taken of investment and operation costs. Final choice given solutions lighting system should be compromise among necessity of energy saving and with limited budget of investor. In report will be represent analysis of energy efficiency and economic of different solutions road lighting of select way.

Notes:

SEPIC converter for high power LED lighting

Wojciech Wojtkowski

Recently, high brightness LED lighting in residential, automotive and industry applications becomes feasible and can replace the incandescent bulbs, halogen bulbs or compact fluorescent light bulbs as well. In such applications, high power factor, and low harmonics are particularly important. It can also be significant to step up or step down input voltage with possibly simple single-stage conversion for low cost and high efficiency. A SEPIC converter has the ability to regulate an output voltage that is either larger or smaller in magnitude than the input voltage. Other converters have this ability as well, but usually create an output voltage that is opposite in polarity to the input voltage, which can be treated as a disadvantage. In this paper a high power factor SEPIC converter for the high brightness LED lighting applications is presented. Discussed converter can be easily controlled with standard analog voltages and can deliver dimmable LED light. The harmonics of the input current are reduced and the power factor is relatively high, because the input inductor current follows the input voltage. A current feedback loop is implemented to control the LED brightness. The discussed circuit has certain advantages, like only one stage of power conversion and no need to sense the input voltage. It can step up and down the supply voltage and has relatively high power factor and dimmable LED current. The critical design constraints and equations for both the power stage and control loop are discussed in the paper. A practical evaluation board based on the AVR microcontroller was developed to verify the proposed design and some interesting results are presented.

Notes:

Calculation of Road Lighting realized on LEDs

Sławomir Zalewski

Complementation method of luminous intensity distribution creation in road lighting can lead to generating low uniformity of lighting. In particular events, when light spots are located suitable to calculation points given by standard PN-EN 13201 results of calculations done with typical programs are incompatible to real lighting effect. Programs show fulfillment of standard requirements when the real light distribution is wrong. As a protection behind overlooking this mistakes and appropriating them to realization modification of calculation methods looks as necessary. Calculation in set of sub points located adequate to standard calculation points is one of possible methods. This solution allows to eliminate incorrect draft without changing another aspect of road lighting verification given by standard.

Notes:

Local Lighting Luminaires for People with Eyesight Impairments

Andrzej Pawlak

The paper presents lighting preferences of people with moderately impaired eyesight as well as suggestions for lighting of work places for that group of people, based on foreign literature. The main principles were estimated for a luminaire provided for additional lighting of working places for people with eyesight impairments. It presents also design of such luminaire prepared in CIOP-PIB, together with measurement results of its lighting parameters.

Notes:

ROLE OF ILLUMINATION IN PROPERTY PROTECTION

Gyorgy Takacs

The role of lighting nowadays iss increased int he property protection. This role is double. The aim of lighting is to see in dark houres, in addition to the illumination have to keep back the malavolently man to penetrate into the establishment under protection and to give enough light for video systems to show the incident int he centre (this can be far away). Nawadays the lighting of industrial and commercial projects are planned considering many circumstances. The one of them at the present time is lighting demands of the property protection. The cost of lighting and protection system can be very high in industrial and commercial projects, this is why very important to coordinate the two systems. I try to show the lighting demands of property protection and present finished and operating systems.

Notes:

Power solutions for emergency lighting of tunnels, underpasses and ecoduct

Stanislav Mišák, Jaroslav Šnobl, František Dostál

In this paper, one of the possibilities of an independent power supply emergency lighting of tunnels. Power should provide a combination of renewable resource (photovoltaic panels, wind power). This paper aims to estimate the investment costs of such a project and compare it with commonly used UPS and genset. Concrete concept for a hybrid system will be implemented for Klimkovice tunnel.

Notes:

Practical possibilities of lighting of pedestrian crossings

Zdeněk Bláha

Lighting of pedestrian crossing is very responsible issue, because people's lives depend on the quality of lighting. The norm for road lighting is not too extensive for the sphere of lighting of pedestrian crossing and therefore the proposal of lighting has relatively large freedom for his ideas, creativity but unfortunately also for his mistakes. In my report I have documented several types of lighting of pedestrian crossing and also I advert to their advantages and disadvantages.

Notes:

Implementation of public lighting and control system TELE in Hustopeče u Brna

Zdeněk Bláha

At the present time the prices of energy have risen therefore is very important during projecting of lighting systems also to criticize their energy intensity. The company Thorn Lighting offers solution: TELEA – the system of operating and controlling of public lighting. This system works with DALI interface. One of the first applications in the Czech Republic was realized in Hustopeče near Brno. In this town system TELEA operates and controls more than 500 lighting sources.

Notes:

Indoor optical free space networks – reflectivity of light on building materials

Jan Vitásek, Petr Koudelka, Jan Látal, František Dostál, Karel Sokanský

Over the past decade rapid development happened in the field of communication technologies based on optical fibers. Over the past decade rapid development happened in the field of communication technologies based on an optical fibers. These technologies become dominant in the field of the last mile networks as well (WDM-PON, GePON, EPON, etc.). As an alternative to the last mile networks can be considered the so-called free space optical networks (FSO). Currently, diffusion systems make an interesting concept into the future. They use secondary sources - building materials inside the room. Therefore it is necessary to pay attention to an issue of the light reflectivity on building materials.

Notes:

Effect of night illumination advertising banner on the surrounding residential houses

P. Vrbík, Z. Židková, P. Baxant

Evaluation of possible impact of artificial lighting induced by eye catchers on population in near house building. Objectification of actual situation, responses of inhabitants, posibility of remedial measure including recommendation.

Notes:

Helvar / 920 IMAGINE ROUTER commercial architectural lighting control DALI / DMX / SDIM

Josef Neduchal

Today, even relatively modest lighting combines commercial and architectural elements. For example, hotels with energy-efficient lighting in public areas and lounges or large office building, where the required combination of energy efficient internal lighting with external planar decorative facade lighting.
Imagine Helvar 920 Router is modular in their execution control module, which contains the best that could be in commercial architectural lighting control systems offer. At the same time very simplifies installers, system integrators and lighting designers.
Imagine 920 Router also enables the connection of third party systems, such as building management systems, heating, ventilation, air conditioning and audio / video equipment.

Notes:

CONTENT

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