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Proposals for the development of ICNIRP guidelines on limits for optical radiation exposures

■ More accurate definition of measurement quantities

➢ Use of correct mathematical expressions, eg

$$E_{\text{eff}} = \int_{l_1}^{l_2} dE(l)/dl \cdot s(l)\,dl$$

instead of

$$E_{\text{eff}} = \sum E_l \cdot S_l \cdot \Delta l$$

➢ Use of a more specific term like ultraviolet hazard irradiance E_s for a specifically defined quantity instead of a general expression like effective irradiance E_{eff}

➢ Use of quantities defined in compendia and standards. The standard prEN 14255-4 will specify quantities for the measurement of optical radiation exposures.

■ Annual UV exposure limit value

➢ Recommendation of an additional annual UV exposure limit value in order to protect against long term effects, like skin cancer and cataract of the eyes.

➢ The annual limit value could be set to $H_{\text{eff}} = 4000$ J/m².

■ Splitting of IR exposure limit values for the eyes (780 to 3000 nm)

➢ Limit value to avoid thermal injury of the cornea

$E_{\text{IR}} \leq 18\, t^{-3/4}$ kW/m² (for $t \leq 10$ s)

➢ Limit value to avoid cataract of the lens

$H_{\text{IR}} \leq 3 \cdot 10^6$ J/m² (for t up to 8 h)

■ Revision of emission values for Class 2 lasers

➢ In lab and field trials only 20% of the test persons show a blink reflex when exposed to Class 2 lasers.

➢ As the Class 2 laser safety philosophy is based on aversion responses (including the blink reflex) within 0.25 s a revision of the Class 2 laser definition is proposed.

➢ Proposed emission values for Class 2 lasers:

0.6mW and 2s in compliance with the MPE

IR exposure near a glass melting furnace

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