DIN 5031-11:2011-04 (E)

Optical radiation physics and illuminating engineering - Part 11: Radiometer for measuring actinic radiant quantities - Terms, characteristics and their classification

Contents

Page

Foreword ... 4

1 Scope ... 5

2 Normative references ... 5

3 Terms and definitions ... 5

4 Characteristics and properties ... 8
4.1 General ... 8
4.2 Measurands and action spectra ... 8
4.3 Characteristic of the calibration uncertainty f_{kal} ... 8
4.4 Lower and upper limits of the measuring range ... 8
4.5 Operating conditions ... 8
4.6 Uncertainties of measurement ... 9
4.7 System response to radiation outside the spectral range of the action spectrum ... 9
4.7.1 General ... 9
4.7.2 Characteristics f_u and f_o for the response to radiation below or above the action range ... 9
4.8 Characteristic of the spectral adaptation f_1 ... 10
4.9 Characteristics of the direction-dependent evaluation ... 11
4.9.1 General ... 11
4.9.2 Characteristic for the irradiance f_2 ... 11
4.9.3 Characteristic for the spatial irradiance $f_{2,0}$ ... 12
4.9.4 Characteristic for the radiance $f^*_{2,L}(\varepsilon,\varphi)$ ... 12
4.10 Characteristic of non-linearity f_3 ... 12
4.10.1 General ... 12
4.10.2 Measurement ... 12
4.10.3 Identification ... 13
4.11 Characteristic of the display device f_4 ... 13
4.12 Characteristic of fatigue f_5 ... 14
4.13 Characteristic of temperature dependency f_6 ... 15
4.14 Characteristic for the influence of the radiation modulation f_7 ... 16
4.15 Characteristic for the influence of polarised radiation f_8 ... 16
4.16 Characteristic of unequal local sensitivity f_9 ... 16
4.17 Characteristic of measuring range changeover f_{11} ... 17

5 Broadband radiometer ... 17
5.1 Structure of a broadband radiometer ... 17
5.2 Requirements for broadband radiometers ... 17
5.3 Calibration ... 18

6 Spectral-measuring radiometer (spectroradiometer) ... 18
6.1 Structure of a spectroradiometer ... 18
6.2 Characteristics of spectroradiometers ... 18
6.2.1 Useful spectral range ... 18
6.2.2 Optical characteristics of the spectral apparatus ... 18
6.2.3 Minimum required measuring time ... 19

6.3 Calculation of the actinic effective radiant quantity X_{act} 19
6.4 Calibration 19
6.5 Requirements for spectroradiometers 19
7 Dosimeter 19
7.1 General 19
7.2 Instrumental dosimeter 20
7.3 Chemical dosimeter 20
7.4 Biological dosimeter 20
7.5 Calibration 21
7.6 Particularities when indicating the characteristics according to Clause 4 for chemical and biological dosimeters 21
8 Classification 22
Annex A (informative) **Determination of the erroneous radiation response 24**
Annex B (normative) **Reference spectra 25**
Annex C (informative) **Performing integral measurements 67**
Annex D (informative) **Performing spectral measurements 68**
Bibliography 69