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# Measurement Method of Display Colour Properties Depending on Observers

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#### **FOREWORD**

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  - The text of this standard is based on the following documents:

XXX	Report on voting
100/XXX/XXX	100/XXX/XXX

- Full information on the voting for its approval can be found in the report on voting indicated in the above table.
- 127 The language used for the development of this International Standard is English.
- This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives. Part 1 and ISO/IEC Directives. IEC Supplement.

- available at <a href="https://www.iec.ch/members\_experts/refdocs">www.iec.ch/members\_experts/refdocs</a>. The main document types developed by IEC are described in greater detail at <a href="https://www.iec.ch/standardsdev/publications">www.iec.ch/standardsdev/publications</a>.
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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- 138 amended.

140 INTRODUCTION

In colorimetry, metamerism or metameric failure is defined as a perceived matching of colours while two colours having different spectral power distributions (SPDs). Illuminant metamerism occurs when two objects match in colour under a specific illuminant, but mismatch under another illuminant with a different SPD. Likewise, observer metamerism (OM) is defined by two stimuli with different SPDs that match in colour for a specific observer. However, the stimuli could not match for another observer. OM is caused by the normal variations in the spectral responsivities of various observers. In other words, observers do not have identical colour-matching functions (CMFs). The observer model considering the age and the field size of observers different from the standard observer has already been standardised in the CIE (CIE Pub. 170-1:2006).

Meanwhile, display manufacturers and users have required the measuring methods of the OM which occurs in display uses. For example, as the development of display technology and grafting of display technology to various application fields and mass distribution, it has become a common situation for users to use multiple displays at the same time. When using multiple displays at the same time, user can display the same colour through the calibration process. However, this is only valid for certain observers because of OM. Also, when users watch a single display, there could be observer dependency in colour perception even though the display is calibrated.

Based on the CIE standards and research results of OM, a new technical specification is suggested to measure the difference in display colour properties according to the observer in an objective way, excluding subjective effects of evaluators.

# Measurement Method of Display Colour Properties Depending on Observers

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#### 1 Scope

This document defines an objective colour difference metric and a measurement method for observer metamerism caused by displays with different spectral power distributions. This document also specifies the measuring equipment, conditions and methods that are necessary to obtain the metric. This document applies to light-emitting or backlit transmitting colour displays measured under dark-room conditions.

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#### 2 Normative references

- The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition
- cited applies. For undated references, the latest edition of the referenced document (including
- any amendments) applies.
- 178 IEC 60050-845, International Electrotechnical Vocabulary Part 845:Lighting (available at
- 179 www.electropedia.org)
- 180 IEC 62977-2-1:2021, Electronic displays Part 2-1: Measurements of optical characteristics -
- 181 Fundamental measurements
- 182 CIE 015:2018, Colorimetry, 4th Edition
- 183 CIE 170-1:2006, Fundamental chromaticity diagram with physiological axes part 1
- 184 CIE 170-2:2015, Fundamental chromaticity diagram with physiological axes part 2

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#### 3 Terms and definitions

#### 187 3.1 Terms and definitions

- 188 For the purposes of this document, the following terms and definitions apply.
- 189 ISO and IEC maintain terminological databases for use in standardization at the following addresses:
- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

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#### 3.1.1 Observer metamerism

Differences in metameric matches when made by different observers. Identical spectral pairs will be identified as the same colour for all observers with their individual CMFs. However, when the spectral power distributions of the two stimuli differ, and only metameric matching is possible, a match made by one observer will typically not match for other observers. This is also called metameric failure.<sup>[1]</sup>

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#### 3.1.2 Observer metamerism index

202 The value of colour difference due to observer metamerism characteristics of a display.

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204 Note: Metamerism indices exist for illuminant metamerism but not for observer metamerism.

#### 3.1.3 Optical radiant unit (ORU) 205

- A unit in a display from which light of a distinct spectral power distribution is radiated. 206
- 207 Note 1: Unit can be present in direct-view and projection displays with temporally and/or spatially fused colour. In the case of projection, spectral irradiance is measured. 208

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#### 3.1.4 Multi optical-radiant-unit (ORU) display

Display with more than three optical radiant units with different spectral power distributions. 211

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#### 3.2 **Abbreviations**

- For the purpose of this document, the following abbreviated terms apply. 214
- 215 ABC Automatic brightness control
- CCT Correlated colour temperature 216
- CIE Commission Internationale de L'Eclairage (International Commission on 217
- Illumination) 218
- **CIELAB** CIE 1976 (L\*a\*b\*) colour space 219
- **CMFs** Colour-matching functions 220
- DUT Device under test 221
- FS Field size 222
- LMD Light measuring device 223
- 224 OM Observer metamerism
- ORU Optical radiant unit 225
- SPD Spectral power distribution 226

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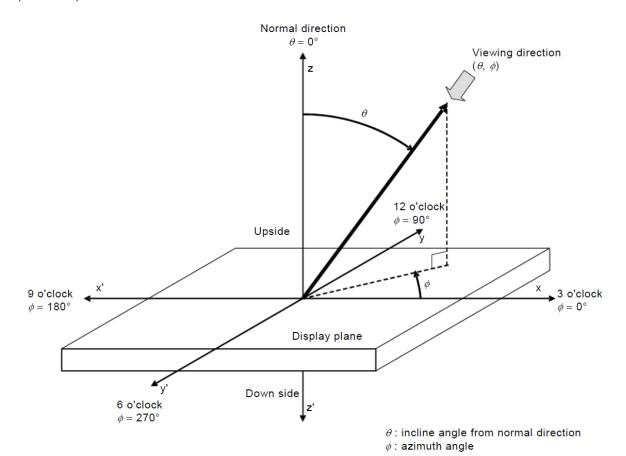
#### Measuring equipment

#### Light measuring devices 4.1

- The system configurations and/or operating conditions of the measuring equipment shall 230 comply with the structure specified in each item. 231
- To ensure reliable measurements, the following requirements apply to the light measuring 232 equipment, listed below: 233
- 1) Spectroradiometer: the wavelength range shall be at least from 380 nm to 780 nm, and the 234 wavelength scale accuracy shall be less than 1 nm. The relative luminance uncertainty of 235 measured luminance (Relative to CIE illuminant A source) shall not be greater than 4% for 236 luminance values over 0.1 cd/m<sup>2</sup> and not be greater than 10% for luminance values 0.1 cd/m<sup>2</sup> 237 and below. Note that errors from spectral stray light within a spectroradiometer can be 238 significant and shall be corrected. A simple matrix method may be used to correct the stray 239 light errors, by which stray light errors can be reduced for one to two orders of magnitudes. 240 Details of this correction method are discussed in Reference [2]. If the obtained luminance is 241
- lower than LMD limitation, the lower limit of the LMD shall be recorded with measured 242
- **luminance** 243

#### 4.2 Viewing direction coordinate system

The viewing direction is the direction under which the observer looks at the spot of interest on the display. During the measurement, the LMD is replacing the observer, looking from the same direction at a specified spot (i.e. measuring spot, measurement field) on the DUT. The viewing direction is conveniently defined by two angles: the angle of inclination  $\theta$  (related to the surface normal of the DUT) and the angle of rotation  $\phi$  (also called azimuth angle) as illustrated in Figure 1. The azimuth angle is related to the directions on a watch-dial as follows:  $\phi = 0^{\circ}$  is referred to as the 3 o'clock direction ("right"),  $\phi = 90^{\circ}$  as the 12 o'clock direction ("top"),  $\phi = 180^{\circ}$  as the 9 o'clock direction ("left") and  $\phi = 270^{\circ}$  as the 6 o'clock direction ("bottom").



Key

- 3 o'clock: right edge of the screen as seen from the user
- 6 o'clock: bottom edge of the screen as seen from the user
- 9 o'clock: left edge of the screen as seen from the user
- 12 o'clock: top edge of the screen as seen from the user

Figure 1 – Representation of the viewing direction (equivalent to the direction of measurement) by the angle of inclination,  $\theta$  and the angle of rotation (azimuth angle),  $\phi$  in a polar coordinate system

#### 5 Measuring conditions

#### 5.1 Standard measuring environmental conditions

Measurements shall be carried out under standard environmental conditions:

• Temperature:  $25 \, {}^{\circ}\text{C} \pm 3 \, {}^{\circ}\text{C},$ 

Relative humidity:
 25 % RH to 85 % RH,

• Atmospheric pressure: 86 kPa to 106 kPa.

When different environmental conditions are used, they shall be noted in the measurement report.

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#### 5.2 Power supply

The power supply for driving the DUT shall be adjusted to the rated voltage  $\pm$  0,5 %. In addition, the frequency of power supply shall provide the rated frequency  $\pm$  0,2 %.

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#### 5.3 Warm-up time

Measurements shall be carried out after sufficient warm-up. Warm-up time is defined as the time elapsed from when the supply source is switched on, and a 100 % grey level of input signal is applied to the DUT, until repeated measurements of the display show a variation in luminance of no more than 2 % per minute and 5 % per hour.

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#### 5.4 Standard measuring dark-room conditions

The luminance contribution from the background illumination reflected off the test display shall be  $< 0.01 \text{ cd/m}^2$ . If these conditions are not satisfied, then background subtraction is required and it shall be noted in the measurement report. In addition, if the sensitivity of the LMD is inadequate to measure these low levels, then the lower limit of the LMD shall be noted in the measurement report.

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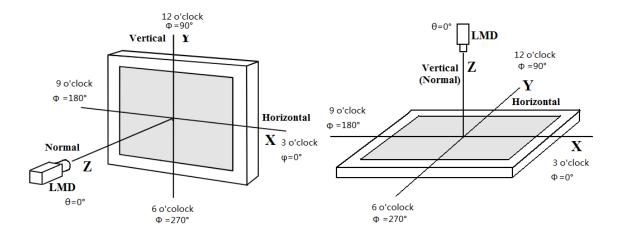
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#### 5.5 Standard set-up conditions

By default, the display shall be installed in the vertical position (Figure 2a), but the horizontal alternative (Figure 2b) is also allowed. When the latter alternative is used, it shall be noted in the measurement report.

The display shall be configured to the factory settings, default settings, or any viewing mode agreed on by the supplier and the customer, and the settings recorded in the test report. These settings shall be held constant for all measurements. It is important, however, to make sure that not only the adjustments are kept constant, but also that the resulting physical quantities remain constant during the measurement. This is not automatically the case because of, for example, warm-up effects or auto-dimming features. Any automatic luminance or gain control shall be turned off. Otherwise it should be noted in the report. The automatic brightness control (ABC) or ambient light control, which can reduce the display luminance level with dim ambient illumination, shall be turned off. If that is not possible, it is recommended to set it to turn on no lower than 300 lx to minimize the influence of the ABC as specified in IEC 62087-3: 2015, 6.4.4. The state of the ABC shall be reported. In addition, if the display has an auto-dimming feature which reduces to less than 95% of original luminance when a static image is displayed after a prolonged time, then a black frame shall be input and the display luminance shall be measured with 1s sampling time until the display recovers its original luminance with 5% error prior to rendering and measuring the desired test pattern. The measurements shall be completed before the dimming feature is triggered. When the display has the option to be set for different viewing modes, the viewing mode shall be defined by the test specification, and be used with consistency for all measurements. Additional viewing modes can also be measured. The viewing mode used during testing shall be reported. The display should be operated in a mode that does not have over-scan.



a) Primary installation

b) Alternative installation

Figure 2 - DUT Installation conditions

#### 6 Measuring methods

#### 6.1 Individual colour-matching functions

CIE presented XYZ tristimulus representation based on cone fundamentals from the technical reports CIE 170-1 and CIE 170-2 in 2006 and 2015 respectively. In CIE 170-1, the cone fundamentals are defined as the spectral sensitivity functions the long-wave sensitive (L-), medium-wave sensitive (M-) and short-wave sensitive (S-) cones, and effects of age and field size are incorporated. In CIE 170-2, linear transformations of the cone fundamentals in the form of cone-fundamental-based XYZ tristimulus values are presented for  $2^{\circ}$  and  $10^{\circ}$  field sizes. Thus, if age and field size of an observer are given, corresponding XYZ tristimulus values can be computed based on CIE 170-1 and 170-2 technical reports. In this technical specification, the field size is set to  $2^{\circ}$ . The colour-matching functions of individual observers transformed from the cone fundamentals will be defined as individual CMFs, and they will be used to compute the XYZ tristimulus values. Also CIE CMFs which mean the functions  $\bar{x}(\lambda)$ ,  $\bar{y}(\lambda)$ ,  $\bar{z}(\lambda)$  in the CIE 1931 standard colorimetric system will be called standard CMFs to distinguish it from the individual CMFs.

Since age is the only variable of the individual CMFs, age distribution data is necessary when deciding the weight of each individual CMFs. For the data on age distribution, only officially published data should be used. A representative example is United Nations world population prospect data. Annex A shows an example of generating an individual CMFs dataset. Prepare a set of individual CMFs by referring to the method in Annex A and use it in evaluation method.

#### 6.2 Reference colours

To evaluate the observer-dependent colour rendering properties of a display, a set of reference colours to be compared with the DUT's spectral response to input test signals, is required. In this technical specification, the set is defined by the Macbeth colour checker patches 13-19 and the CIE D65 illuminant. Even though a variety of colour sets as reference colours have been used in the previous studies [1] [4], only seven colours were selected as the reference colours. If it is necessary to evaluate a display using more colours, it is recommended to select a set of colours uniformly sampled in the CIE 1976 L\*a\*b\* colour space with D65 as reference white.

For the illuminant of the reference colours, CIE standard illuminant D65 is used. The SPDs of the seven reference colours are summarised in Annex B. The D65 SPD in Annex B is

normalised data, and in this technical specification, D65 SPD should be rescaled to have maximum luminance of the DUT.

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#### 6.3 Observer metamerism index

#### 6.3.1 Purpose

The purpose of this method is to evaluate the observer metamerism of a display.

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#### 6.3.2 Measuring conditions

The following measuring conditions apply:

- a) Apparatus: An LMD to measure spectral radiance and luminance of the DUT; a driving power source; a driving signal equipment; and a geometric mechanism as illustrated in Figure 2, a driving power supply, and driving signal equipment.
- b) Standard measuring environmental conditions; dark-room conditions; standard setup conditions.

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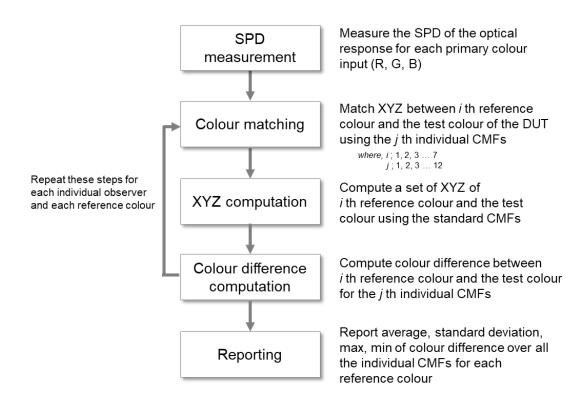
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#### 6.3.3 Measurement method

The evaluation method of observer metamerism index consists of five steps: SPD measurement, colour matching, XYZ computation, colour difference computation and reporting. The flowchart of the overall evaluation method is shown in the Figure 3.

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Figure 3 - Flowchart of the overall evaluation method

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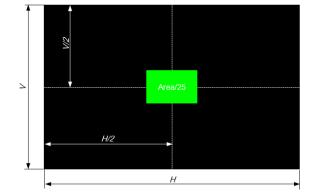
#### 6.3.3.1 SPD measurement

1) Render the three area centre box patterns corresponding to normalised {R, G, B} input signals {1,0,0}, {0,1,0}, and {0,0,1} or, for 8-bit grey quantization, {255,0,0}, {0,255,0}, and {0,0,255}, respectively. Figure 4 shows an example of a centre box pattern with an APL of 4%. If the DUT exhibits loading, reduce the APL with a requirement of minimum 0.5%, making sure that the measurement field covers subpixels corresponding to at least 500 input pixels.

Area/25

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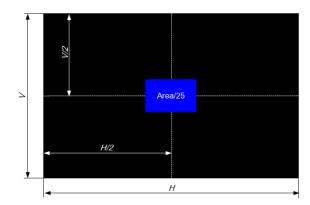


Figure 4 - 4% area centre box patterns of primary colours

- 2) Align the LMD perpendicular to the display surface ( $\theta$  = 0,  $\phi$  = 0), and position it to the centre of the display.
- 3) Measure the SPDs of the primary colours respectively at the screen centre.

#### 6.3.3.2 Colour matching

 4) Calculate the XYZ values of *i*th reference colour using individual CMFs, which stand for the CMFs of *j*th individual observer, as shown in equation (1). See Annex A for individual CMFs and Annex B for the SPDs of reference colours.

$$X'_{r(i,j)} = L_s \cdot k_j \int_{390}^{780} \Phi_{r(i)}(\lambda) \cdot \bar{x}'_j(\lambda) d\lambda$$

$$Y'_{r(i,j)} = L_s \cdot k_j \int_{390}^{780} \Phi_{r(i)}(\lambda) \cdot \bar{y}'_j(\lambda) d\lambda$$
(1)

$$Z'_{r(i,j)} = L_s \cdot k_j \int_{390}^{780} \Phi_{r(i)}(\lambda) \cdot \bar{z}'_j(\lambda) d\lambda$$

where

 $X'_{r(i,j)}$ ,  $Y'_{r(i,j)}$  and  $Z'_{r(i,j)}$  denote the XYZ values of *i*th reference colour using individual CMFs of *i*th individual observer:

 $\bar{x}'_i(\lambda)$ ,  $\bar{y}'_i(\lambda)$  and  $\bar{z}'_i(\lambda)$  denote the CMFs of *j*th individual observer;

 $\Phi_{r(i)}(\lambda)$  denotes the SPD of *i*th reference colour defined in equation (2);

$$\Phi_{r(i)}(\lambda) = S_{D65}(\lambda) \cdot R_i(\lambda) \tag{2}$$

where

 $S_{D65}(\lambda)$  denotes the SPD of CIE Standard D<sub>65</sub> illuminant;

 $R_i(\lambda)$  denotes the spectral reflectance of the *i*th reference colour;

 $L_s$  is the scaling factor to match the normalised relative XYZ values of reference colours with the absolute XYZ values of the test colours of the DUT. Here, use the maximum luminance of the DUT as explained in 6.2;

 $k_i$  is the normalisation constant for jth individual observer and is defined in equation (3).

$$k_{j} = \frac{1}{\int_{390}^{780} S_{D65}(\lambda) \cdot \bar{y}_{j}(\lambda) d\lambda}$$

$$\tag{3}$$

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5) Calculate the weighting factors of SPDs of the DUT response corresponding to the normalised inputs {1,0,0}, {0,1,0}, and {0,0,1}. The colour matching process can be expressed as equation (4) of adding up the SPDs to match the XYZ values of the DUT using the individual CMFs with the reference XYZ values calculated in 4). The weighting factors can be calculated by solving the linear matrix in equation (5) which is derived from equation(4).

 $\begin{bmatrix} X_{r(i,j)}^{'} \\ Y_{r(i,j)}^{'} \\ Z_{r(i,j)}^{'} \end{bmatrix} = \begin{bmatrix} X_{R(j)}^{'} & X_{G(j)}^{'} & X_{B(j)}^{'} \\ Y_{R(j)}^{'} & Y_{G(j)}^{'} & Y_{B(j)}^{'} \\ Z_{R(g)}^{'} & Z_{G(j)}^{'} & Z_{B(j)}^{'} \end{bmatrix} \cdot \begin{bmatrix} w_{R(i,j)} \\ w_{G(i,j)} \\ w_{B(i,j)} \end{bmatrix}$  (4)

$$\begin{bmatrix} w_{R(i,j)} \\ w_{G(i,j)} \\ w_{B(i,j)} \end{bmatrix} = \begin{bmatrix} X'_{R(j)} & X'_{G(j)} & X'_{B(j)} \\ Y'_{R(j)} & Y'_{G(j)} & Y'_{B(j)} \\ Z'_{R(j)} & Z'_{G(j)} & Z'_{B(j)} \end{bmatrix}^{-1} \cdot \begin{bmatrix} X'_{r(i,j)} \\ Y'_{r(i,j)} \\ Z'_{r(i,j)} \end{bmatrix}$$
(5)

where

 $w_{R(i,j)}, w_{G(i,j)}$  and  $w_{B(i,j)}$  are the weighting factors calculated from the colour-matching;

 $X'_{Q(j)}$ ,  $Y'_{Q(j)}$  and  $Z'_{Q(j)}$  (Q = R, G, B) are XYZ stimulus values of primary colours of the DUT using the jth individual observer, and defined in equation (6).

$$X'_{Q(j)} = 683 \int_{390}^{780} \Phi_Q(\lambda) \cdot \bar{x}_j(\lambda) d\lambda$$
 (6)

$$Y'_{Q(j)} = 683 \int_{390}^{780} \Phi_Q(\lambda) \cdot \bar{y}'_j(\lambda) d\lambda$$

$$Z'_{Q(j)} = 683 \int_{390}^{780} \Phi_Q(\lambda) \cdot \bar{z}'_j(\lambda) d\lambda$$

where

 $\Phi_R(\lambda)$ ,  $\Phi_G(\lambda)$  and  $\Phi_R(\lambda)$  are the SPDs of the primary colours, and Q = R, G and B.

As a result, the SPD of the test colour of the DUT matched with the *i*th reference colour can be obtained.

$$\Phi_{t(i,j)}(\lambda) = \begin{bmatrix} W_{R(i,j)} & W_{G(i,j)} & W_{B(i,j)} \end{bmatrix} \cdot \begin{bmatrix} \Phi_{R}(\lambda) & \Phi_{G}(\lambda) & \Phi_{B}(\lambda) \end{bmatrix}^{T}$$
(7)

where

 $\Phi_{t(i,j)}(\lambda)$  is the SPD of the test colour matched with the *i*th reference colour for *j*th individual observer.

In case the DUT has more than three ORUs, see Annex D.

#### 6.3.3.3 XYZ computation

6) Calculate the XYZ values of *i*th reference colour using CIE 1931 standard colorimetric observer as shown in equation (8).

$$X_{r(i)} = L_s \cdot k \int_{390}^{780} \Phi_{r(i)}(\lambda) \cdot \bar{x}(\lambda) d\lambda$$

$$Y_{r(i)} = L_s \cdot k \int_{390}^{780} \Phi_{r(i)}(\lambda) \cdot \bar{y}(\lambda) d\lambda$$

$$Z_{r(i)} = L_s \cdot k \int_{390}^{780} \Phi_{r(i)}(\lambda) \cdot \bar{z}(\lambda) d\lambda$$
(8)

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411 where

 $X_{r(i)}$ ,  $Y_{r(i)}$  and  $Z_{r(i)}$  are the XYZ values of *i*th reference colour using CIE 1931 standard colorimetric observer;

414 415 416  $L_s$  is the scaling factor and k is the normalisation constant for the CIE 1931 standard colorimetric observer defined as equation (9).

$$k = \frac{1}{\int_{390}^{780} S_{D65} \cdot \bar{y}(\lambda) d\lambda} \tag{9}$$

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7) Calculate the XYZ values of the test colour using the SPD of the test colour obtained in equation (7) and the CIE 1931 standard colorimetric observer as shown in equation (10).

$$X_{t(i,j)} = 683 \int_{390}^{780} \Phi_{t(i,j)}(\lambda) \cdot \bar{x}(\lambda) d\lambda$$

$$Y_{t(i,j)} = 683 \int_{390}^{780} \Phi_{t(i,j)}(\lambda) \cdot \bar{y}(\lambda) d\lambda$$
(10)

$$Z_{t(i,j)} = 683 \int_{390}^{780} \Phi_{t(i,j)}(\lambda) \cdot \bar{z}(\lambda) d\lambda$$

421 where

 $X_{t(i,j)}$ ,  $Y_{t(i,j)}$  and  $Z_{t(i,j)}$  are the XYZ values of the test colour matched with *i*th reference colour for *j*th individual observer.

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#### 6.3.3.4 Colour difference computation

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8) Transform both XYZ value sets obtained in steps 6) and 7) into the three-dimensional CIELAB colour space (per ISO 11664-4). The CIELAB L\*, a\* and b\* values are calculated from the transformed tristimulus values using the following equations:

$$L^* = 116 \cdot f\left(\frac{Y}{Y_n}\right) - 16$$

$$a^* = 500 \cdot \left[f\left(\frac{X}{X_n}\right) - f\left(\frac{Y}{Y_n}\right)\right]$$

$$b^* = 200 \cdot \left[f\left(\frac{Y}{Y_n}\right) - f\left(\frac{Z}{Z_n}\right)\right]$$
(11)

429 where

$$f(t) = \begin{cases} t^{1/3} & t < \left(\frac{6}{29}\right)^3 \\ \frac{1}{3} \left(\frac{29}{6}\right)^2 t + \frac{16}{116} & otherwise \end{cases}$$
 (12)

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and  $X_n$ ,  $Y_n$  and  $Z_n$  are defined as XYZ tristimulus values of the reference white multiplied by the scaling factor  $L_s$  as shown in equation (13);

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435 where

 $X_{Ref\_W}$ ,  $Y_{Ref\_W}$  and  $Z_{Ref\_W}$  are the normalised XYZ values of the reference white, that is the CIE Standard D<sub>65</sub> illuminant.

$$X_{Ref\_W} = k \int_{390}^{780} S_{D65}(\lambda) \cdot \bar{x}(\lambda) d\lambda$$

$$Y_{Ref\_W} = k \int_{390}^{780} S_{D65}(\lambda) \cdot \bar{y}(\lambda) d\lambda$$

$$Z_{Ref\_W} = k \int_{390}^{780} S_{D65}(\lambda) \cdot \bar{z}(\lambda) d\lambda$$

$$(14)$$

9) Calculate the CIE DE2000  $\Delta E_{00}$  between the reference colour and the test colour according to following equations:

$$C_{i,ab}^* = \sqrt{(a_i^*)^2 + (b_i^*)^2}$$
 (15)

$$\bar{C}_{ab}^* = (C_{1,ab}^* + C_{2,ab}^*)/2 \tag{16}$$

$$G = 0.5 \left( 1 - \sqrt{\frac{(\bar{C}_{ab}^*)^7}{(\bar{C}_{ab}^*)^7 + 25^7}} \right)$$
 (17)

$$a_i' = (1+G)a_i^* (18)$$

$$C_i' = \sqrt{(a_i')^2 + (b_i^*)^2} \tag{19}$$

$$h'_{i} = \begin{cases} 0 & \text{if } b_{i}^{*} = a'_{i} = 0 \\ \tan^{-1}(b_{i}^{*}, a'_{i}) & \text{otherwise} \end{cases}$$
 (20)

$$\Delta L' = L_2^* - L_1^* \tag{21}$$

$$\Delta C' = C_2' - C_1' \tag{22}$$

$$\Delta h_i' = \begin{cases} 0 & C_2' C_1' = 0 \\ h_2' - h_1' & C_2' C_1' \neq 0 & |h_2' - h_1'| \leq 180^{\circ} \\ (h_2' - h_1') - 360 & C_2' C_1' \neq 0 & (h_2' - h_1') > 180^{\circ} \\ (h_2' - h_1') + 360 & C_2' C_1' \neq 0 & (h_2' - h_1') < -180^{\circ} \end{cases}$$
(23)

$$\Delta H' = 2\sqrt{C_2'C_1'}\sin\left(\frac{\Delta h'}{2}\right) \tag{24}$$

$$\overline{L'} = (L_2^* - L_1^*)/2 \tag{25}$$

$$\overline{C'} = (C_2' - C_1')/2 \tag{26}$$

$$\bar{h}' = \begin{cases}
\frac{h'_2 + h'_1}{2} & |h'_2 + h'_1| \le 180^{\circ} & C'_2 C'_1 \ne 0 \\
\frac{h'_2 + h'_1 + 360^{\circ}}{2} & |h'_2 + h'_1| > 180^{\circ} & (h'_2 + h'_1) < 360^{\circ} & C'_2 C'_1 \ne 0 \\
\frac{h'_2 + h'_1 - 360^{\circ}}{2} & |h'_2 + h'_1| > 180^{\circ} & (h'_2 + h'_1) \ge 360^{\circ} & C'_2 C'_1 \ne 0 \\
\frac{h'_2 + h'_1}{2} & C'_2 C'_1 \ne 0
\end{cases}$$
(27)

$$T = 1 - 0.17\cos(\bar{h'} - 30^\circ) + 0.24\cos(2\bar{h'}) + 0.32\cos(3\bar{h'} + 6^\circ) - 0.2\cos(4\bar{h'} - 63^\circ)$$
 (28)

$$\Delta\theta = 30exp\left\{-\left(\frac{\overline{h'} - 275^{\circ}}{25}\right)^{2}\right\} \tag{29}$$

$$R_C = 2\sqrt{\frac{\bar{C'}^7}{\bar{C'}^7 + 25^7}} \tag{30}$$

$$S_L = 1 + \frac{0.015(\bar{L}' - 50)^2}{\sqrt{20 + (\bar{L}' - 50)^2}}$$
(31)

$$S_C = 1 + 0.045\bar{C}' \tag{32}$$

$$S_H = 1 + 0.015\bar{C}'T\tag{33}$$

$$R_T = -\sin(2\Delta\theta)R_C \tag{34}$$

$$\Delta E_{00} = \sqrt{\left(\frac{\Delta L'}{k_L S_L}\right)^2 + \left(\frac{\Delta C'}{k_C S_C}\right)^2 + \left(\frac{\Delta H'}{k_H S_H}\right)^2 + R_T \left(\frac{\Delta C'}{k_C S_C}\right) \left(\frac{\Delta H'}{k_H S_H}\right)}$$
(35)

- 10) Repeat the process 4) ~ 10) for each individual observer.
- 11) Repeat the process 4) ~ 11) for each reference colour.

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#### 6.3.3.5 Reporting

- 12) Report maximum, minimum, average and standard deviation of CIE DE2000  $\Delta E_{00}$  values over all the individual observers (See Table 1).
- 13) Report maximum, minimum, average and standard deviation of CIE DE2000  $\Delta E_{00}$  values over all the individual observers and all the reference colours to provide a set of representative OMI values (See Table 1).

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#### 7 Reporting form

Report maximum, minimum, average and standard deviation values of OMI obtained in 6.3.3.5 using the form shown in Table 1. Also, present a graph showing the spectral plots of metameric pairs of reference colour and DUT as shown in Figure 5.

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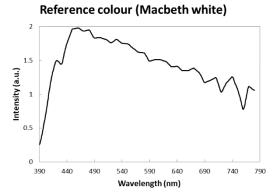
# Table 1 – Reporting form of observer metamerism index

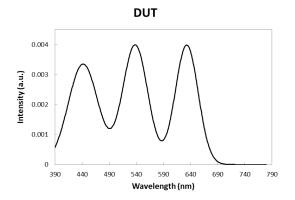
D (	Observer metamerism index					
Reference colour ( <i>i</i> =1~7)	Maximum	Minimum	Average	Standard deviation		
Macbeth white (1)						
Macbeth red (2)						
Macbeth green (3)						

Macbeth blue (4)		
Macbeth cyan (5)		
Macbeth magenta (6)		
Macbeth yellow (7)		
Total		

Figure 5 – Reporting example of a graph of colour-matched metameric pair of reference colour and DUT

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# 464 Annex A 465 (informative)

# Generating a set of individual CMFs

# A.1 Age distribution data

When generating a set of individual CMFs using CIE 170-1 and 2, age and field size  $(F_s)$  data are required. Among them,  $F_s$  can be selected by the standard user in consideration of the application field and the use environment of the DUT. The  $2^\circ$  field size is recommended in this technical specification.

For age distribution data, officially published data could be used. For example, Table A.1 shows age distribution data published by the United Nations world population prospect. [6] Users of this technical specification can use various age distribution data depending on the purpose of measurement, but officially published data should be used. In the case of the CIE 170-1 model, only the age range of 20 to 80 is reflected. Therefore, it is possible to reflect only the age range of 20 to 80 years of age distribution data.

Table A.1 – Example of age distribution data published by the United Nations world population prospect

Location		World					
Time		2020					
Sex		Both					
0-4	677 942	9%					
5-9	664 439	9%	34%				
10-14	641 267	8%					
15-19	612 196	8%					
20-24	597 388	8%	8%				
25-29	594 692	8%	8%				
30-34	605 531	8%	8%				
35-39	544 819	7%	7%				
40-44	493 789	6%	6%				
45-49	479 366	6%	6%				
50-54	445 773	6%	6%				
55-59	387 849	5%	5%				
60-64	322 142	4%	4%				
65-69	269 644	3%	3%				
70-74	188 677	2%	2%				
75-79	123 782	2%	4%				
80-84	81 930	1%					
85-89	42 186	1%					
90-94	16 680	0%	2%				
95-99	4 134	0%					
100+	573	0%					
Total	7 794 799	100%	100%				

Age distribution data determine the number of CMFs dataset. If the data is constructed by 1 year interval, the number of dataset would be more than 150 datasets. If the age interval is 10 years, you get 1/10 of the dataset compared to the first one. For a large number of datasets, the appropriate number of datasets should be applied to the number of iterations of the evaluation. Therefore, it is easy to use the evaluation method to reduce the number of datasets without distorting the statistical significance of the age distribution. In this technical specification, it is recommended to use at least 20 datasets.

#### A.2 Example of individual CMFs dataset

Table A.2 shows the example of age distribution data. The original data are distribution data consisting of 5-year intervals from 20 to 79 years old, and the total is 100%. The last column is the data in which the number of iterations is reduced without statistical distortion to simplify the measurement as described in A.1. If field size is fixed to 2° and using the reduced age distribution data, a total of 20 individual CMFs is generated and the Table A.3 shows the result.

Table A.2 - Example of age distribution data

Age	Original data [%]	Reduced data [%]
20-24	5%	1%
25-29	15%	3%
30-34	15%	3%
35-39	10%	2%
40-44	10%	2%
45-49	15%	3%
50-54	5%	1%
55-59	5%	1%
60-64	5%	1%
65-69	5%	1%
70-74	5%	1%
75-79	5%	1%
Total	100%	20%

The individual CMFs results using data of Table A.2 are shown in Table A.3 and Table A.4 to Table A.7. The Table A.4 to Table A.7 show the SPDs data of individual CMFs generated with the 2° field size and the median value of each age group (i.e. 22 in the case of 20 to 24), and Table A.3 shows the number of each age group or the corresponding individual CMFs. That number will be used as the weight when calculating average value of the OMI over the age groups or individual observers.

Table A.3 - Total number of individual CMFs example

Individual CMFs $(j = 1 \sim 12)$	Age range	Age group	Number
1	20-24	22	1
2	25-29	27	3
3	30-34	32	3
4	35-39	37	2
5	40-44	42	2

6	45-49	47	3
7	50-54	52	1
8	55-59	57	1
9	60-64	62	1
10	65-69	67	1
11	70-74	72	1
12	75-79	77	1
	Total		20

The  $\bar{x}$ ,  $\bar{y}$ ,  $\bar{z}$  data for each age group included in Table A.4 to Table A.7 are the calculated result using the 2° field size matrix in CIE 170-2. The cone fundamentals used in the calculation were calculated through the ocular media optical density function, which is a function reflecting age, and macular pigment optical density function, visual pigment optical density function, which is a function reflecting field size, referring to CIE 170-1. For details, please refer to CIE 170-1 and 170-2.

Note 1: 2° field size matrix in CIE 170-2 is only for the average observer (32-year-old). However, in this document the same matrix is used for all the age groups only to be used for the colour matching process.

Table A.4 - Spectral sensitivity data of the individual CMFs (Age group: 22, 27 and 32)

Age group		22			27			32	
Wavelength (nm)	$\overline{x}_1'$	$\overline{y}_1'$	$ar{z}_1'$	$\overline{x}_2'$	$\overline{y}_2'$	$ar{z}_2'$	$\overline{x}_3'$	$\overline{y}_3'$	$ar{z}_3'$
390	0.00567	0.00068	0.02750	0.00502	0.00058	0.02451	0.00445	0.00049	0.02184
395	0.01237	0.00153	0.06015	0.01115	0.00131	0.05454	0.01005	0.00113	0.04942
400	0.02652	0.00322	0.13006	0.02433	0.00281	0.11994	0.02231	0.00246	0.11055
405	0.05485	0.00631	0.27171	0.05120	0.00561	0.25487	0.04779	0.00498	0.23894
410	0.10077	0.01123	0.50357	0.09536	0.01010	0.47863	0.09023	0.00909	0.45468
415	0.15791	0.01717	0.80074	0.15172	0.01568	0.77213	0.14575	0.01431	0.74416
420	0.21792	0.02390	1.12039	0.21147	0.02203	1.09045	0.20517	0.02030	1.06076
425	0.26188	0.03030	1.36844	0.25632	0.02816	1.34237	0.25083	0.02616	1.31610
430	0.30379	0.03813	1.61285	0.29896	0.03561	1.58968	0.29416	0.03324	1.56603
435	0.32991	0.04696	1.78599	0.32763	0.04423	1.77501	0.32531	0.04164	1.76318
440	0.35118	0.05615	1.93485	0.35117	0.05321	1.93485	0.35109	0.05041	1.93385
445	0.33990	0.06325	1.91165	0.34229	0.06033	1.92372	0.34464	0.05752	1.93485
450	0.31657	0.07048	1.82164	0.32084	0.06761	1.84338	0.32512	0.06483	1.86442
455	0.27487	0.07821	1.62759	0.27989	0.07532	1.65342	0.28499	0.07250	1.67879
460	0.23952	0.09142	1.47910	0.24497	0.08832	1.50733	0.25055	0.08528	1.53531
465	0.21185	0.11305	1.37864	0.21769	0.10958	1.40977	0.22375	0.10618	1.44085
470	0.17109	0.13798	1.20234	0.17643	0.13400	1.23189	0.18206	0.13009	1.26151
475	0.12106	0.16219	0.95551	0.12537	0.15794	0.98163	0.13005	0.15374	1.00793
480	0.07584	0.18810	0.71908	0.07879	0.18357	0.74036	0.08217	0.17907	0.76188
485	0.04225	0.21639	0.53277	0.04384	0.21157	0.54961	0.04592	0.20678	0.56668
490	0.01933	0.24850	0.38747	0.01958	0.24336	0.40040	0.02037	0.23824	0.41355
495	0.00781	0.29675	0.29258	0.00672	0.29110	0.30286	0.00626	0.28545	0.31334
500	0.00568	0.36160	0.22324	0.00309	0.35521	0.23142	0.00124	0.34880	0.23978
505	0.00978	0.44255	0.16101	0.00545	0.43545	0.16719	0.00199	0.42830	0.17353
510	0.02495	0.53644	0.10973	0.01869	0.52883	0.11417	0.01344	0.52113	0.11872
515	0.05585	0.63719	0.07694	0.04764	0.62933	0.08021	0.04058	0.62135	0.08357
520	0.09546	0.73516	0.05233	0.08541	0.72711	0.05463	0.07664	0.71890	0.05701
525	0.14517	0.81122	0.03465	0.13368	0.80346	0.03622	0.12353	0.79551	0.03785
530	0.20209	0.87299	0.02245	0.18948	0.86586	0.02351	0.17826	0.85849	0.02460
535	0.26220	0.92129	0.01439	0.24879	0.91482	0.01508	0.23678	0.90810	0.01580
540	0.33248	0.96662	0.00902	0.31851	0.96116	0.00947	0.30594	0.95544	0.00993
545	0.40321	0.99113	0.00560	0.38918	0.98691	0.00589	0.37652	0.98241	0.00619
550	0.47147	0.99599	0.00345	0.45786	0.99313	0.00363	0.44556	0.98998	0.00382
555	0.54899	1.00370	0.00211	0.53598	1.00219	0.00223	0.52422	1.00040	0.00235
560	0.63280	0.99872	0.00130	0.62065	0.99834	0.00137	0.60967	0.99768	0.00145
565	0.71874	0.98946	0.00080	0.70790	0.99043	0.00084	0.69813	0.99113	0.00089
570	0.81068	0.96984	0.00049	0.80157	0.97209	0.00052	0.79344	0.97409	0.00055
575	0.89538	0.93662	0.00030	0.88841	0.94003	0.00032	0.88231	0.94323	0.00034

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580         0.96935         0.88845         0.00019         0.96490         0.89288         0.00020         0.96120         0.88708         0.00021           585         1.05208         0.84390         0.00012         1.05007         0.85440         0.00013         1.04870         0.85936         0.00014           590         1.10629         0.80093         0.00008         1.10877         0.80660         0.00008         1.10781         0.81216         0.00009           595         1.13669         0.74299         0.00005         1.13863         0.74902         0.00003         1.14240         0.75499         0.00006           600         1.12072         0.61570         0.00002         1.12712         0.62156         0.00002         1.13386         0.62739         0.00002           610         1.08819         0.54764         0.00001         0.95869         0.64872         0.00002         1.08331         0.55870         0.00002           615         0.99971         0.47959         0.00001         0.95869         0.48472         0.00001         0.91406         0.42322         0.00000           625         0.79733         0.35300         0.0000         0.89540         0.00000         0.81444 <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>										
590         1.10629         0.80093         0.00008         1.10677         0.80660         0.00008         1.10781         0.81216         0.00009           595         1.13669         0.74299         0.00005         1.1383         0.74902         0.00005         1.14204         0.75499         0.00004           600         1.12072         0.61570         0.00002         1.12712         0.62150         0.00002         1.13868         0.69229         0.00004           605         1.12072         0.61570         0.00002         1.12712         0.62156         0.00002         1.13868         0.62739         0.00001           610         1.06819         0.54764         0.00001         1.07560         0.55317         0.00002         1.08331         0.55870         0.00001           615         0.99071         0.47959         0.000001         0.99869         0.48472         0.00001         1.06938         0.50000         0.6901         0.29469         0.00000         0.91466         0.42322         0.00000           620         0.89793         0.41403         0.00000         0.89559         0.41862         0.00000         0.89144         0.29214         0.00000         0.25760         0.00000         0.65910	580	0.96935	0.88845	0.00019	0.96490	0.89285	0.00020	0.96120	0.89708	0.00021
595         1.13569         0.74299         0.00005         1.13863         0.74902         0.00005         1.14204         0.75499         0.00006           600         1.14007         0.68051         0.00003         1.12473         0.86843         0.00003         1.14980         0.68229         0.00004           610         1.06819         0.54764         0.00001         1.07560         0.55317         0.00002         1.03831         0.55870         0.00002           615         0.99071         0.47959         0.00001         0.99889         0.48472         0.00001         1.06833         0.55870         0.00002           620         0.89793         0.41403         0.00000         0.99589         0.41862         0.00000         0.91406         0.42322         0.00000           620         0.79793         0.35300         0.00000         0.86560         0.35705         0.00000         0.81444         0.36111         0.00000           630         0.67802         0.29116         0.00000         0.68615         0.29489         0.00000         0.69244         0.29824         0.00000           631         0.46172         0.18928         0.00000         0.68719         0.29189         0.19183         <		1.05208	0.84930	0.00012	1.05007	0.85440	0.00013	1.04870	0.85936	0.00014
600         1.14007         0.68051         0.00003         1.14473         0.68643         0.00003         1.14980         0.69229         0.00004           605         1.12072         0.61570         0.00002         1.12712         0.62156         0.00002         1.13386         0.52739         0.00002           610         1.06819         0.54764         0.00001         1.07560         0.55317         0.00002         1.08331         0.55870         0.00001           615         0.99071         0.47959         0.00001         0.99869         0.48472         0.00001         1.09836         0.08968         0.00001         0.91466         0.42322         0.00001           620         0.88793         0.41403         0.00000         0.80560         0.35756         0.00000         0.81446         0.42322         0.00000           635         0.76802         0.29116         0.00000         0.68515         0.29469         0.00000         0.69244         0.29814         0.00000           635         0.56600         0.23576         0.00000         0.66739         0.19183         0.00000         0.57556         0.24181         0.00000           645         0.37500         0.15086         0.00000         <	590	1.10629	0.80093	0.00008	1.10677	0.80660	0.00008	1.10781	0.81216	0.00009
605         1.12072         0.61570         0.00002         1.12712         0.62156         0.00002         1.13386         0.62739         0.00002           610         1.06819         0.54764         0.00001         1.07560         0.55317         0.00002         1.08331         0.55870         0.00001           620         0.89783         0.41403         0.00000         0.98689         0.41862         0.00000         0.91406         0.42322         0.00000           625         0.79793         0.35300         0.00000         0.80560         0.35705         0.00000         0.81344         0.36111         0.00000           630         0.67802         0.29116         0.00000         0.86815         0.23877         0.00000         0.87566         0.24181         0.00000           633         0.56260         0.23576         0.00000         0.58901         0.23877         0.00000         0.57566         0.24181         0.00000           640         0.46172         0.18928         0.00000         0.46739         0.19183         0.00000         0.34845         0.15482         0.00000           650         0.22161         0.11613         0.00000         0.24783         0.08857         0.00000         <	595	1.13569	0.74299	0.00005	1.13863	0.74902	0.00005	1.14204	0.75499	0.00006
610         1.06819         0.54764         0.00001         1.07560         0.55317         0.00002         1.08331         0.55870         0.00002           615         0.99071         0.47959         0.00001         0.99869         0.48472         0.00001         1.00693         0.48986         0.00001           620         0.89793         0.435300         0.00000         0.9589         0.41862         0.00000         0.91406         0.42322         0.00000           625         0.79793         0.35300         0.00000         0.80560         0.35765         0.00000         0.89244         0.29116         0.00000         0.68515         0.29469         0.00000         0.69244         0.29284         0.00000           635         0.56260         0.23576         0.00000         0.48737         0.00000         0.57556         0.24181         0.00000           645         0.37500         0.15068         0.00000         0.47373         0.15274         0.00000         0.38455         0.15482         0.00000           650         0.22180         0.01633         0.00000         0.22478         0.08857         0.00000         0.2783         0.05844         0.00900           655         0.22180 <t< td=""><td>600</td><td>1.14007</td><td>0.68051</td><td>0.00003</td><td>1.14473</td><td>0.68643</td><td>0.00003</td><td>1.14980</td><td>0.69229</td><td>0.00004</td></t<>	600	1.14007	0.68051	0.00003	1.14473	0.68643	0.00003	1.14980	0.69229	0.00004
615         0.99071         0.47959         0.00001         0.99869         0.48472         0.00001         1.00693         0.48986         0.00001           620         0.89793         0.41403         0.00000         0.90589         0.41482         0.00000         0.91406         0.42322         0.00000           625         0.79793         0.35300         0.00000         0.86561         0.25705         0.00000         0.81344         0.36111         0.00000           630         0.67802         0.29116         0.00000         0.68515         0.29469         0.00000         0.68244         0.29824         0.00000           635         0.56260         0.23576         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           640         0.46172         0.18828         0.00000         0.37973         0.15274         0.00000         0.47315         0.19441         0.00000           645         0.37500         0.15068         0.00000         0.23979         0.11937         0.00000           655         0.22160         0.1813         0.00000         0.22478         0.0857         0.00000         0.19361         0.025999         0.11937 <t< td=""><td>605</td><td>1.12072</td><td>0.61570</td><td>0.00002</td><td>1.12712</td><td>0.62156</td><td>0.00002</td><td>1.13386</td><td>0.62739</td><td>0.00002</td></t<>	605	1.12072	0.61570	0.00002	1.12712	0.62156	0.00002	1.13386	0.62739	0.00002
620         0.89793         0.41403         0.00000         0.90589         0.41862         0.00000         0.91406         0.42322         0.00000           625         0.79793         0.35300         0.00000         0.80560         0.35705         0.00000         0.81344         0.36111         0.00000           630         0.67802         0.29116         0.00000         0.68515         0.29469         0.00000         0.67556         0.24181         0.00000           635         0.56260         0.23576         0.00000         0.68901         0.23877         0.00000         0.57556         0.24181         0.00000           640         0.46172         0.18928         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           645         0.37500         0.15668         0.00000         0.23793         0.15274         0.00000         0.38455         0.15482         0.00000           655         0.22160         0.161613         0.00000         0.22478         0.08857         0.00000         0.29793         0.191704         0.00000         0.22478         0.08857         0.00000         0.16261         0.06461         0.06461         0.00000         0.12488 <td>610</td> <td>1.06819</td> <td>0.54764</td> <td>0.00001</td> <td>1.07560</td> <td>0.55317</td> <td>0.00002</td> <td>1.08331</td> <td>0.55870</td> <td>0.00002</td>	610	1.06819	0.54764	0.00001	1.07560	0.55317	0.00002	1.08331	0.55870	0.00002
625         0.79793         0.35300         0.00000         0.80560         0.35705         0.00000         0.81344         0.36111         0.00000           630         0.67802         0.29116         0.00000         0.68515         0.29469         0.00000         0.69244         0.29824         0.00000           635         0.56260         0.23576         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           640         0.46172         0.18928         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           645         0.37500         0.15068         0.00000         0.37973         0.15274         0.0000         0.23478         0.0000           650         0.222160         0.11613         0.00000         0.22478         0.08857         0.0000         0.22783         0.19321         0.19321         0.19321         0.0000           665         0.222180         0.04763         0.00000         0.12868         0.04832         0.00000         0.12641         0.04902         0.0000           675         0.06461         0.02483         0.00000         0.06551         0.02519	615	0.99071	0.47959	0.00001	0.99869	0.48472	0.00001	1.00693	0.48986	0.00001
630         0.67802         0.29116         0.00000         0.68515         0.29469         0.00000         0.69244         0.29824         0.00000           635         0.56260         0.23576         0.00000         0.56901         0.23877         0.00000         0.57556         0.24181         0.00000           640         0.46172         0.18928         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           645         0.37500         0.15068         0.00000         0.37973         0.15274         0.00000         0.38455         0.15482         0.00000           650         0.22180         0.08732         0.00000         0.22478         0.08857         0.00000         0.22783         0.08984         0.00000           660         0.16621         0.06484         0.00000         0.12468         0.06579         0.00000         0.17083         0.06674         0.00000           670         0.08461         0.03243         0.00000         0.04581         0.00000         0.04581         0.00000         0.09227         0.03562         0.00000           680         0.04584         0.01758         0.00000         0.04677         0.01833         <	620	0.89793	0.41403	0.00000	0.90589	0.41862	0.00000	0.91406	0.42322	0.00000
635         0.56260         0.23576         0.00000         0.56901         0.23877         0.00000         0.57556         0.24181         0.00000           640         0.46172         0.18928         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           645         0.37500         0.15088         0.00000         0.37973         0.15274         0.00000         0.38455         0.15482         0.00000           650         0.29216         0.11613         0.00000         0.29594         0.11774         0.00000         0.29979         0.11937         0.00000           655         0.22180         0.08732         0.00000         0.22478         0.08857         0.0000         0.22783         0.08994         0.00000           660         0.16621         0.06484         0.00000         0.26579         0.00000         0.17083         0.06674         0.00000           665         0.12299         0.04763         0.00000         0.04852         0.00000         0.12641         0.04902         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556 <t< td=""><td>625</td><td>0.79793</td><td>0.35300</td><td>0.00000</td><td>0.80560</td><td>0.35705</td><td>0.00000</td><td>0.81344</td><td>0.36111</td><td>0.00000</td></t<>	625	0.79793	0.35300	0.00000	0.80560	0.35705	0.00000	0.81344	0.36111	0.00000
640         0.46172         0.18928         0.00000         0.46739         0.19183         0.00000         0.47316         0.19441         0.00000           645         0.37500         0.15068         0.00000         0.37973         0.15274         0.00000         0.38455         0.15482         0.00000           650         0.222180         0.01673         0.00000         0.29594         0.11774         0.00000         0.229783         0.08984         0.00000           655         0.22180         0.08732         0.00000         0.16850         0.06579         0.00000         0.17933         0.06674         0.00000           660         0.16621         0.06484         0.00000         0.16850         0.06579         0.00000         0.17933         0.06674         0.00000           670         0.08977         0.03461         0.00000         0.04584         0.00000         0.06571         0.00000         0.06621         0.02562         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556         0.00000           680         0.04584         0.01758         0.00000         0.03248         0.01244	630	0.67802	0.29116	0.00000	0.68515	0.29469	0.00000	0.69244	0.29824	0.00000
645         0.37500         0.15068         0.00000         0.37973         0.15274         0.00000         0.38455         0.15482         0.00000           650         0.29216         0.11613         0.00000         0.29594         0.11774         0.00000         0.29979         0.11937         0.00000           655         0.22180         0.08732         0.00000         0.22478         0.08857         0.00000         0.22783         0.08984         0.00000           660         0.16621         0.06484         0.00000         0.16850         0.06579         0.00000         0.12641         0.04902         0.00000           665         0.12299         0.04763         0.00000         0.12468         0.04832         0.00000         0.12641         0.04902         0.00000           670         0.08977         0.03461         0.00000         0.09101         0.03511         0.00000         0.09227         0.03562         0.00000           675         0.06461         0.02483         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           680         0.03233         0.01226         0.00000         0.03248         0.01244         0.00000         <	635	0.56260	0.23576	0.00000	0.56901	0.23877	0.00000	0.57556	0.24181	0.00000
650         0.29216         0.11613         0.00000         0.29594         0.11774         0.00000         0.29799         0.11937         0.00000           655         0.22180         0.08732         0.00000         0.22478         0.08857         0.00000         0.22783         0.08984         0.00000           660         0.16621         0.06484         0.00000         0.16850         0.06579         0.00000         0.17083         0.06674         0.00000           665         0.12299         0.04763         0.00000         0.12468         0.04832         0.00000         0.12641         0.04902         0.00000           670         0.08977         0.03461         0.00000         0.09101         0.03511         0.00000         0.09227         0.03562         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556         0.00000           680         0.04584         0.01758         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           695         0.02201         0.00842         0.00000         0.02232         0.00854         0.00000         <	640	0.46172	0.18928	0.00000	0.46739	0.19183	0.00000	0.47316	0.19441	0.00000
655         0.22180         0.08732         0.00000         0.22478         0.00000         0.22783         0.08984         0.00000           660         0.16621         0.06484         0.00000         0.16850         0.06579         0.00000         0.17083         0.06674         0.00000           665         0.12299         0.04763         0.00000         0.12468         0.04832         0.00000         0.12641         0.04902         0.00000           670         0.08977         0.03461         0.00000         0.09111         0.03511         0.00000         0.06227         0.03562         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.0000         0.06421         0.01809         0.00000           680         0.04584         0.01758         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           685         0.03203         0.01226         0.00000         0.02232         0.00854         0.00000         0.02263         0.00867         0.00000           690         0.02201         0.00842         0.00000         0.01554         0.00595         0.00000         0.01576 <t< td=""><td>645</td><td>0.37500</td><td>0.15068</td><td>0.00000</td><td>0.37973</td><td>0.15274</td><td>0.00000</td><td>0.38455</td><td>0.15482</td><td>0.00000</td></t<>	645	0.37500	0.15068	0.00000	0.37973	0.15274	0.00000	0.38455	0.15482	0.00000
660         0.16621         0.06484         0.00000         0.16850         0.06579         0.00000         0.17083         0.06674         0.00000           665         0.12299         0.04763         0.00000         0.12468         0.04832         0.00000         0.12641         0.04902         0.00000           670         0.08977         0.03461         0.00000         0.09101         0.03511         0.00000         0.09227         0.03562         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556         0.00000           680         0.04584         0.01758         0.00000         0.04647         0.01773         0.00000         0.03293         0.01226         0.00000           685         0.03203         0.01226         0.00000         0.03248         0.01244         0.00000         0.03293         0.01262         0.00000           690         0.02201         0.00842         0.00000         0.02232         0.0854         0.00000         0.01576         0.0063         0.00000           700         0.01667         0.0048         0.00000         0.01554         0.00595         0.00000	650	0.29216	0.11613	0.00000	0.29594	0.11774	0.00000	0.29979	0.11937	0.00000
665         0.12299         0.04763         0.00000         0.12468         0.04832         0.00000         0.12641         0.04902         0.00000           670         0.08977         0.03461         0.00000         0.09101         0.03511         0.00000         0.09227         0.03562         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556         0.00000           680         0.04584         0.01758         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           685         0.03203         0.01226         0.00000         0.03248         0.01244         0.00000         0.02263         0.00867         0.00000           690         0.02201         0.00842         0.00000         0.01554         0.00595         0.00000         0.01576         0.00603         0.00000           695         0.01533         0.00586         0.00000         0.01682         0.00414         0.00000         0.01576         0.00603         0.00000           700         0.01067         0.00488         0.00000         0.00514         0.00197         0.00000         <	655	0.22180	0.08732	0.00000	0.22478	0.08857	0.00000	0.22783	0.08984	0.00000
670         0.08977         0.03461         0.00000         0.09101         0.03511         0.00000         0.09227         0.03562         0.00000           675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556         0.00000           680         0.04584         0.01758         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           685         0.03203         0.01226         0.00000         0.02232         0.00854         0.00000         0.03293         0.01262         0.00000           690         0.02201         0.00842         0.00000         0.02559         0.00000         0.01576         0.00867         0.00000           695         0.01533         0.00586         0.00000         0.01576         0.00603         0.00000           700         0.01667         0.00408         0.00000         0.00751         0.00241         0.00000         0.01576         0.00603         0.00000           710         0.00557         0.00144         0.00000         0.00514         0.00197         0.00022         0.00200         0.00522         0.00200         0.00527         <	660	0.16621	0.06484	0.00000	0.16850	0.06579	0.00000	0.17083	0.06674	0.00000
675         0.06461         0.02483         0.00000         0.06551         0.02519         0.00000         0.06642         0.02556         0.00000           680         0.04584         0.01758         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           685         0.03203         0.01226         0.00000         0.03248         0.01244         0.00000         0.03293         0.01262         0.00000           690         0.02201         0.00842         0.00000         0.02323         0.00854         0.00000         0.02263         0.00867         0.00000           695         0.01533         0.00586         0.00000         0.01554         0.00595         0.00000         0.01576         0.00603         0.00000           700         0.01067         0.0048         0.00000         0.0182         0.00414         0.00000         0.01977         0.00420         0.00000           705         0.00740         0.00283         0.00000         0.00514         0.00197         0.00200         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00037 <td< td=""><td>665</td><td>0.12299</td><td>0.04763</td><td>0.00000</td><td>0.12468</td><td>0.04832</td><td>0.00000</td><td>0.12641</td><td>0.04902</td><td>0.00000</td></td<>	665	0.12299	0.04763	0.00000	0.12468	0.04832	0.00000	0.12641	0.04902	0.00000
680         0.04584         0.01758         0.00000         0.04647         0.01783         0.00000         0.04712         0.01809         0.00000           685         0.03203         0.01226         0.00000         0.03248         0.01244         0.00000         0.03293         0.01262         0.00000           690         0.02201         0.00842         0.00000         0.02232         0.00854         0.00000         0.02263         0.00867         0.00000           695         0.01533         0.00586         0.00000         0.01554         0.00595         0.00000         0.01576         0.00603         0.00000           700         0.01067         0.00488         0.00000         0.0182         0.00414         0.00000         0.0197         0.00420         0.00000           705         0.00740         0.00283         0.00000         0.00571         0.00287         0.00000         0.00761         0.00291         0.00000           710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000 <td< td=""><td>670</td><td>0.08977</td><td>0.03461</td><td>0.00000</td><td>0.09101</td><td>0.03511</td><td>0.00000</td><td>0.09227</td><td>0.03562</td><td>0.00000</td></td<>	670	0.08977	0.03461	0.00000	0.09101	0.03511	0.00000	0.09227	0.03562	0.00000
685         0.03203         0.01226         0.00000         0.03248         0.01244         0.00000         0.03293         0.01262         0.00000           690         0.02201         0.00842         0.00000         0.02232         0.00854         0.00000         0.02263         0.00867         0.00000           695         0.01533         0.00586         0.00000         0.01554         0.00595         0.00000         0.01676         0.00603         0.00000           700         0.01067         0.00408         0.00000         0.0182         0.00414         0.00000         0.0197         0.00420         0.00000           705         0.00740         0.00283         0.00000         0.00571         0.00287         0.00000         0.00761         0.00291         0.00000           710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000         0.00357         0.00137         0.00000           720         0.00240         0.00092         0.00000         0.00148         0.00093         0.00000 <td< td=""><td>675</td><td>0.06461</td><td>0.02483</td><td>0.00000</td><td>0.06551</td><td>0.02519</td><td>0.00000</td><td>0.06642</td><td>0.02556</td><td>0.00000</td></td<>	675	0.06461	0.02483	0.00000	0.06551	0.02519	0.00000	0.06642	0.02556	0.00000
690         0.02201         0.00842         0.00000         0.02232         0.00854         0.00000         0.02263         0.00867         0.00000           695         0.01533         0.00586         0.00000         0.01554         0.00595         0.00000         0.01576         0.00603         0.00000           700         0.01067         0.00408         0.00000         0.01082         0.00414         0.00000         0.0197         0.00420         0.00000           705         0.00740         0.00283         0.00000         0.0051         0.00287         0.00000         0.00761         0.00291         0.00000           710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000         0.00247         0.00093         0.00000         0.00247         0.00095         0.00000           720         0.00166         0.00064         0.00000         0.00168         0.00065         0.00000         0.00170         0.00065         0.00000           730         0.0115         0.00044         0.00000	680	0.04584	0.01758	0.00000	0.04647	0.01783	0.00000	0.04712	0.01809	0.00000
695         0.01533         0.00586         0.00000         0.01554         0.00595         0.00000         0.01576         0.00603         0.00000           700         0.01067         0.00408         0.00000         0.0182         0.00414         0.00000         0.0197         0.00420         0.00000           705         0.00740         0.00283         0.00000         0.00751         0.00287         0.00000         0.00761         0.00291         0.00000           710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000         0.00357         0.00137         0.00000           720         0.00240         0.00092         0.00000         0.00243         0.00093         0.00000         0.00247         0.00095         0.00000           725         0.00166         0.00064         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           730         0.00115         0.00044         0.00000         0.00171         0.00045         0.00000 <td< td=""><td>685</td><td>0.03203</td><td>0.01226</td><td>0.00000</td><td>0.03248</td><td>0.01244</td><td>0.00000</td><td>0.03293</td><td>0.01262</td><td>0.00000</td></td<>	685	0.03203	0.01226	0.00000	0.03248	0.01244	0.00000	0.03293	0.01262	0.00000
700         0.01067         0.00408         0.00000         0.01082         0.00414         0.00000         0.01097         0.00420         0.00000           705         0.00740         0.00283         0.00000         0.00751         0.00287         0.00000         0.00761         0.00291         0.00000           710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00243         0.00093         0.00000         0.00357         0.00137         0.00000           720         0.00240         0.00092         0.00000         0.00243         0.00093         0.00000         0.00247         0.00095         0.00000           725         0.00166         0.00064         0.00000         0.00117         0.00045         0.00000         0.00119         0.00065         0.00000         0.00119         0.00046         0.00000           730         0.00115         0.00044         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           735         0.00081         0.00021         0.00000         <	690	0.02201	0.00842	0.00000	0.02232	0.00854	0.00000	0.02263	0.00867	0.00000
705         0.00740         0.00283         0.00000         0.00751         0.00287         0.00000         0.00761         0.00291         0.00000           710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000         0.00357         0.00137         0.00000           720         0.00240         0.00092         0.00000         0.00243         0.00093         0.00000         0.00247         0.00095         0.00000           725         0.00166         0.00064         0.00000         0.00117         0.00045         0.00000         0.00119         0.00065         0.00000           730         0.00115         0.00044         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           735         0.00081         0.00031         0.00000         0.00057         0.00022         0.00000         0.00058         0.00001         0.00058         0.00002         0.00008           740         0.00040         0.00015         0.00000         0.00047         <	695	0.01533	0.00586	0.00000	0.01554	0.00595	0.00000	0.01576	0.00603	0.00000
710         0.00507         0.00194         0.00000         0.00514         0.00197         0.00000         0.00522         0.00200         0.00000           715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000         0.00357         0.00137         0.00000           720         0.00240         0.00092         0.00000         0.00243         0.00093         0.00000         0.00247         0.00095         0.00000           725         0.00166         0.00064         0.00000         0.00117         0.00045         0.00000         0.00170         0.00065         0.00000           730         0.00115         0.00044         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           735         0.00081         0.00031         0.00000         0.00082         0.00031         0.00000         0.00031         0.00000         0.00032         0.00000           740         0.00056         0.00022         0.00000         0.00049         0.00015         0.00000         0.00041         0.00000         0.00041         0.00000         0.00041         0.00000         0.00041         0.00000         0.00001         0.00000	700	0.01067	0.00408	0.00000	0.01082	0.00414	0.00000	0.01097	0.00420	0.00000
715         0.00347         0.00133         0.00000         0.00352         0.00135         0.00000         0.00357         0.00137         0.00000           720         0.00240         0.00092         0.00000         0.00243         0.00093         0.00000         0.00247         0.00095         0.00000           725         0.00166         0.00064         0.00000         0.00168         0.00065         0.00000         0.00170         0.00065         0.00000           730         0.00115         0.00044         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           735         0.00081         0.00031         0.00000         0.00031         0.00000         0.00031         0.00000         0.00031         0.00000         0.00032         0.00000         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00024         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000	705	0.00740	0.00283	0.00000	0.00751	0.00287	0.00000	0.00761	0.00291	0.00000
720         0.00240         0.00092         0.00000         0.00243         0.00093         0.00000         0.00247         0.00095         0.00000           725         0.00166         0.00064         0.00000         0.00168         0.00065         0.00000         0.00170         0.00065         0.00000           730         0.00115         0.00044         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           735         0.00081         0.00031         0.00000         0.00031         0.00000         0.00031         0.00000         0.00031         0.00000         0.00031         0.00000         0.00032         0.00000         0.00031         0.00000         0.00031         0.00000         0.00031         0.00000         0.00000         0.00003         0.00000         0.00003         0.00000         0.00003         0.00000         0.00003         0.00000	710	0.00507	0.00194	0.00000	0.00514	0.00197	0.00000	0.00522	0.00200	0.00000
725         0.00166         0.00064         0.00000         0.00168         0.00000         0.00100         0.00000         0.	715	0.00347	0.00133	0.00000	0.00352	0.00135	0.00000	0.00357	0.00137	0.00000
730         0.00115         0.00044         0.00000         0.00117         0.00045         0.00000         0.00119         0.00046         0.00000           735         0.00081         0.00001         0.00002         0.00031         0.00000         0.00031         0.00000         0.00083         0.00032         0.00000           740         0.00056         0.00022         0.00000         0.00022         0.00000         0.00022         0.00000         0.00028         0.00015         0.00000         0.00040         0.00015         0.00000         0.00041         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00000         0.00001         0.00000         <	720	0.00240	0.00092	0.00000	0.00243	0.00093	0.00000	0.00247	0.00095	0.00000
735         0.00081         0.00031         0.00000         0.00082         0.00031         0.00000         0.00083         0.00032         0.00000           740         0.00056         0.00022         0.00000         0.00057         0.00022         0.00000         0.00058         0.00022         0.00000           745         0.00040         0.00015         0.00001         0.00015         0.00000         0.00015         0.00000         0.00011         0.00000         0.00011         0.00000         0.00029         0.00011         0.00000           750         0.00028         0.00011         0.00000         0.00028         0.00011         0.00000         0.00029         0.00011         0.00000           755         0.00020         0.00008         0.00000         0.00002         0.00008         0.00000         0.00002         0.00000	725	0.00166	0.00064	0.00000	0.00168	0.00065	0.00000	0.00170	0.00065	0.00000
740         0.00056         0.00022         0.00000         0.00057         0.00022         0.00000         0.00058         0.00022         0.00000           745         0.00040         0.00015         0.00004         0.00015         0.00000         0.00041         0.00001         0.00001         0.00001         0.00001         0.00001         0.00001         0.00001         0.00001         0.00000         0.00001         0.00001         0.00000         0.00000         0.00001         0.00000	730	0.00115	0.00044	0.00000	0.00117	0.00045	0.00000	0.00119	0.00046	0.00000
745         0.00040         0.00015         0.00000         0.00040         0.00015         0.00000         0.00001         0.00000         0.00041         0.00016         0.00000           750         0.00028         0.00011         0.00002         0.00011         0.00000         0.00029         0.00011         0.00000         0.00029         0.00001         0.00000         0.00000         0.00008         0.000000         0.00000         0.00000         0.00000 <td>735</td> <td>0.00081</td> <td>0.00031</td> <td>0.00000</td> <td>0.00082</td> <td>0.00031</td> <td>0.00000</td> <td>0.00083</td> <td>0.00032</td> <td>0.00000</td>	735	0.00081	0.00031	0.00000	0.00082	0.00031	0.00000	0.00083	0.00032	0.00000
750         0.00028         0.00011         0.00000         0.00028         0.00011         0.00000         0.00029         0.00011         0.00000           755         0.00020         0.00008         0.00000         0.00020         0.00008         0.00000         0.00020         0.00008         0.00000	740	0.00056	0.00022	0.00000	0.00057	0.00022	0.00000	0.00058	0.00022	0.00000
755         0.00020         0.00008         0.00000         0.00020         0.00008         0.00000         0.00008         0.00000         0.	745	0.00040	0.00015	0.00000	0.00040	0.00015	0.00000	0.00041	0.00016	0.00000
760         0.00014         0.00005         0.00000         0.00014         0.00006         0.00000         0.00014         0.00006         0.00001         0.00014         0.00006         0.00001         0.00001         0.00004         0.00000         0.00001         0.00004         0.00000         0.00001         0.00004         0.00000         0.00001         0.00000         0.00001         0.00000         0.	750	0.00028	0.00011	0.00000	0.00028	0.00011	0.00000	0.00029	0.00011	0.00000
765         0.00010         0.00004         0.00000         0.00010         0.00004         0.00000         0.00001         0.00000         0.	755	0.00020	0.00008	0.00000	0.00020	0.00008	0.00000	0.00020	0.00008	0.00000
770         0.00007         0.00003         0.00000         0.00007         0.00003         0.00000         0.00003         0.00000         0.	760	0.00014	0.00005	0.00000	0.00014	0.00006	0.00000	0.00014	0.00006	0.00000
775 0.00005 0.00002 0.00000 0.00005 0.00002 0.00000 0.00005 0.00002 0.00000	765	0.00010	0.00004	0.00000	0.00010	0.00004	0.00000	0.00010	0.00004	0.00000
	770	0.00007	0.00003	0.00000	0.00007	0.00003	0.00000	0.00007	0.00003	0.00000
780   0.00004   0.00001   0.00000   0.00004   0.00002   0.00000   0.00004   0.00002   0.00000	775	0.00005	0.00002	0.00000	0.00005	0.00002	0.00000	0.00005	0.00002	0.00000
	780	0.00004	0.00001	0.00000	0.00004	0.00002	0.00000	0.00004	0.00002	0.00000

# Table A.5 – Spectral sensitivity data of the individual CMFs (Age group: 37, 42 and 47)

Age group		37			42			47	
Wavelength (nm)	$\overline{x}_4'$	$\overline{y}_4'$	$ar{z}_4'$	$\overline{x}_5'$	$\overline{y}_5'$	$ar{z}_5'$	$\overline{x}_6'$	$\overline{y}_6'$	$\bar{z}_6'$
390	0.00392	0.00041	0.01934	0.00346	0.00035	0.01713	0.00305	0.00029	0.01517
395	0.00901	0.00097	0.04452	0.00808	0.00083	0.04011	0.00725	0.00071	0.03614
400	0.02036	0.00214	0.10131	0.01858	0.00187	0.09284	0.01697	0.00163	0.08508
405	0.04438	0.00442	0.22273	0.04122	0.00393	0.20761	0.03829	0.00349	0.19352
410	0.08493	0.00818	0.42944	0.07996	0.00736	0.40560	0.07529	0.00662	0.38309
415	0.13927	0.01307	0.71307	0.13310	0.01193	0.68328	0.12722	0.01089	0.65473
420	0.19799	0.01871	1.02593	0.19108	0.01724	0.99226	0.18445	0.01589	0.95968
425	0.24410	0.02430	1.28293	0.23758	0.02258	1.25059	0.23126	0.02097	1.21907
430	0.28780	0.03103	1.53385	0.28161	0.02897	1.50234	0.27557	0.02704	1.47147
435	0.32114	0.03921	1.74135	0.31706	0.03691	1.71979	0.31304	0.03475	1.69850
440	0.34893	0.04776	1.92172	0.34682	0.04525	1.90967	0.34474	0.04287	1.89769
445	0.34492	0.05485	1.93485	0.34521	0.05229	1.93485	0.34551	0.04986	1.93485
450	0.32741	0.06216	1.87484	0.32974	0.05960	1.88532	0.33209	0.05715	1.89586
455	0.28832	0.06979	1.69474	0.29171	0.06718	1.71083	0.29514	0.06466	1.72709
460	0.25456	0.08235	1.55481	0.25864	0.07953	1.57456	0.26279	0.07680	1.59455
465	0.22838	0.10288	1.46414	0.23311	0.09969	1.48781	0.23794	0.09660	1.51187
470	0.18647	0.12630	1.28441	0.19100	0.12262	1.30772	0.19564	0.11904	1.33146
475	0.13380	0.14965	1.02899	0.13769	0.14567	1.05048	0.14171	0.14180	1.07243
480	0.08489	0.17468	0.77950	0.08774	0.17040	0.79753	0.09074	0.16623	0.81599
485	0.04754	0.20210	0.58093	0.04931	0.19752	0.59553	0.05122	0.19305	0.61050

490 0.02887 0.23932 0.42867 0.02515 0.22833 0.43609 0.02230 0.22340 4.4781 495 0.00582 0.27991 0.32323 0.00513 0.27446 0.33536 0.02480 0.00480 0.28916 0.34105 500 -0.00046 0.42127 0.1790 -0.00246 0.33634 0.25446 -0.00405 0.33028 0.26213 505 -0.00146 0.42127 0.1790 -0.00246 0.33634 0.25446 -0.00405 0.33028 0.02757 0.19057 510 0.00877 0.51356 0.12275 0.00282 0.56609 0.12892 -0.00152 0.48874 0.13122 515 0.03362 0.61348 0.06656 0.02687 0.66671 0.06899 0.02031 0.59805 0.02281 520 0.06800 0.71079 0.05914 0.05956 0.07278 0.06158 0.05133 0.68467 0.00586 525 0.11353 0.78766 0.03933 0.10272 0.77987 0.04056 0.09410 0.77218 0.04246 530 0.166719 0.85121 0.05860 0.15629 0.48399 0.02668 0.04010 0.77218 0.04246 530 0.46719 0.85121 0.05860 0.15629 0.48399 0.02668 0.14556 0.86844 0.02771 535 0.22492 0.90143 0.01646 0.2120 0.98483 0.01715 0.20164 0.88829 0.01787 540 0.289350 0.49476 0.01368 0.28117 0.04413 0.01018 0.26897 0.98384 0.01785 550 0.43311 0.98841 0.00040 0.42112 0.98373 0.00497 0.40898 0.98690 0.00706 550 0.43311 0.98884 0.00004 0.42112 0.98373 0.00497 0.40898 0.98690 0.00706 550 0.43311 0.98841 0.00004 0.42120 0.98885 0.00258 0.48904 0.98910 0.00270 560 0.59888 0.99703 0.00152 0.58769 0.98650 0.00588 0.68683 0.99333 0.00153 575 0.68834 0.999703 0.00152 0.58769 0.98650 0.00026 0.68683 0.99333 0.00153 576 0.78562 0.99184 0.00054 0.77850 0.99257 0.00098 0.68683 0.99333 0.00163 577 0.78562 0.99184 0.00006 0.77970 0.97814 0.00016 0.76669 0.99919 0.00064 580 0.95742 0.99134 0.00026 0.58769 0.99650 0.00024 0.94962 0.99994 0.00055 580 1.14864 0.78710 0.00056 0.77970 0.97814 0.00016 1.15690 0.0004 0.71696 0.00064 0.77072 0.00064 0.000	400	0.00007	0.00000	0.40407	0.00454	0.00000	0.40000	0.00000	0.00054	0.44704
500										
505									1	
510										
515		-0.00146			-0.00474			-0.00783		
520         0.06800         0.71079         0.05914         0.05956         0.70272         0.06136         0.05133         0.69347         0.06366           525         0.11353         0.787865         0.03933         0.10372         0.77897         0.04066         0.09410         0.77218         0.04246           530         0.12791         0.85121         0.02560         0.15229         0.48439         0.02633         0.14556         0.83824         0.01717           540         0.239360         0.94976         0.01036         0.28117         0.94131         0.0181         0.28937         0.90848         0.01736         0.28117         0.94808         0.0038         0.98109         0.0076         0.33938         0.98909         0.00706           550         0.43331         0.98862         0.00246         0.50075         0.98858         0.00288         0.98040         0.04331         0.98962         0.00266         0.55075         0.98858         0.00258         0.48904         0.99577         0.0038         0.98967         0.0038         0.98967         0.0038         0.99577         0.00676         0.5508         0.99577         0.00616         0.55762         0.98940         0.00076         0.5586         0.99577 <t< td=""><td>510</td><td>0.00827</td><td>0.51355</td><td>0.12275</td><td>0.00328</td><td>0.50609</td><td>0.12692</td><td>-0.00152</td><td>0.49874</td><td>0.13122</td></t<>	510	0.00827	0.51355	0.12275	0.00328	0.50609	0.12692	-0.00152	0.49874	0.13122
S25	515	0.03362	0.61348	0.08658	0.02687	0.60571	0.08969	0.02031	0.59805	0.09291
S30	520	0.06800	0.71079	0.05914	0.05956	0.70278	0.06136	0.05133	0.69487	0.06366
535	525	0.11353	0.78765	0.03933	0.10372	0.77987	0.04086	0.09410	0.77218	0.04246
S40	530	0.16719	0.85121	0.02560	0.15629	0.84399	0.02663	0.14556	0.83684	0.02771
545         0.36395         0.97794         0.00666         0.35147         0.97350         0.00675         0.33908         0.96005         0.00706           550         0.43331         0.98884         0.00400         0.42112         0.98875         0.00419         0.46988         0.98065         0.00436           550         0.51247         0.99862         0.00246         0.50075         0.99865         0.00258         0.48904         0.99170         0.0016           560         0.59868         0.99703         0.00152         0.58769         0.99840         0.00159         0.57669         0.99877         0.00015           570         0.78525         0.97611         0.00058         0.77700         0.97814         0.0061         0.76869         0.98077         0.00164           570         0.78525         0.97611         0.00038         0.86979         0.00038         0.8637         0.95296         0.00064           570         0.78742         0.94454         0.00023         0.95356         0.90562         0.09024         0.90994         0.00025           580         1.0542         0.94458         0.00021         1.04877         0.80840         0.00015         1.04149         0.94747         0	535	0.22492	0.90143	0.01646	0.21320	0.89483	0.01715	0.20164	0.88829	0.01787
550         0.43331         0.98684         0.00400         0.42112         0.98373         0.00419         0.40896         0.09365         0.00246           555         0.51247         0.98682         0.00246         0.50075         0.99684         0.00258         0.48904         0.99510         0.00270           565         0.58884         0.99184         0.00094         0.87850         0.99257         0.00098         0.68863         0.99330         0.00159           570         0.78525         0.97811         0.00058         0.7770         0.97841         0.00064         0.0014         0.00641         0.00061         0.7770         0.97841         0.00038         0.86893         0.94970         0.00038         0.86863         0.99310         0.00014           580         0.95742         0.93134         0.00023         0.95856         0.90562         0.00024         0.94962         0.90994         0.00015           585         1.04727         0.88436         0.00014         1.0477         0.89404         0.00015         1.14191         0.4747         0.00016           590         1.10810         0.86143         0.00004         1.15990         0.70420         0.00061         1.15937         0.77321	540	0.29350	0.94976	0.01036	0.28117	0.94413	0.01081	0.26897	0.93854	0.01128
555         0.51247         0.99862         0.0026         0.59608         0.48904         0.99517         0.00162           560         0.59868         0.99703         0.00152         0.58769         0.99547         0.00169         0.57669         0.99577         0.00167           565         0.68834         0.99184         0.00034         0.67850         0.99257         0.00061         0.75669         0.99577         0.00167           570         0.76525         0.97611         0.00028         0.77700         0.97814         0.00061         0.76899         0.98019         0.00021           580         0.9742         0.90134         0.00023         0.96556         0.00024         0.94962         0.98994         0.00025           585         1.04727         0.88436         0.00014         1.04577         0.88940         0.00015         1.04119         0.87447         0.00016           595         1.14542         0.76101         0.00006         1.14876         0.76708         0.00006         1.15207         0.77321         0.00007           600         1.15485         0.69822         0.00001         1.14973         0.6323         0.00011         1.15907         0.77321         0.00001	545	0.36395	0.97794	0.00646	0.35147	0.97350	0.00675	0.33908	0.96909	0.00706
560         0.59868         0.99703         0.00152         0.58769         0.99840         0.00159         0.57669         0.99577         0.00167           565         0.68834         0.99184         0.00058         0.7770         0.97814         0.00061         0.76525         0.00089         0.66863         0.99330         0.00103           577         0.87614         0.94645         0.00036         0.86889         0.94970         0.00038         0.86357         0.95296         0.00040           580         0.95742         0.90134         0.00014         1.04577         0.86846         0.00015         1.04419         0.97447         0.00016           585         1.04727         0.8636         0.00014         1.04577         0.86840         0.00016         1.04419         0.97447         0.00016           590         1.14842         0.76101         0.00009         1.14876         0.76708         0.00006         1.15493         0.7212         0.00004         1.15990         0.70420         0.00004         1.16493         0.7122         0.00004           605         1.14816         0.63228         0.00001         1.15990         0.70420         0.00001         1.15493         0.71222         0.00001	550	0.43331	0.98684	0.00400	0.42112	0.98373	0.00419	0.40898	0.98065	0.00438
565         0.68834         0.99184         0.00094         0.67850         0.99257         0.00098         0.66863         0.99300         0.00103           570         0.78624         0.976114         0.00068         0.777700         0.97814         0.00061         0.76869         0.98019         0.00064           570         0.95742         0.99134         0.00023         0.95366         0.00024         0.94662         0.99994         0.00025           580         0.95742         0.99134         0.00021         0.95620         0.00024         0.94662         0.90994         0.00025           585         1.10880         0.81777         0.00009         1.10872         0.82343         0.00010         1.11693         0.8747         0.00016           595         1.14542         0.76101         0.00006         1.14876         0.76708         0.00004         1.15207         0.77321         0.00004           600         1.14661         0.63328         0.00003         1.14739         0.63923         0.00004         1.16493         0.77321         0.00044           610         1.09105         0.56428         0.00002         1.09882         0.56992         0.00004         1.15417         0.64524	555	0.51247	0.99862	0.00246	0.50075	0.99685	0.00258	0.48904	0.99510	0.00270
570         0.78525         0.97611         0.00058         0.77700         0.97814         0.00061         0.76869         0.98019         0.00064           575         0.87614         0.904645         0.00036         0.86989         0.9970         0.00038         0.86357         0.95286         0.00024           580         0.95742         0.90134         0.00023         0.95556         0.90662         0.00024         0.94862         0.90094         0.0005           585         1.04727         0.86436         0.00014         1.04577         0.86940         0.00015         1.04419         0.87477         0.00016           595         1.14542         0.76101         0.00006         1.14778         0.76708         0.00006         1.15207         0.77321         0.00017           600         1.14641         0.83282         0.00004         1.15909         0.70420         0.00004         1.16403         0.71721         0.00004           610         1.9105         0.56428         0.00002         1.90882         0.59929         0.00002         1.16644         0.57562         0.00003           611         1.01522         0.49780         0.00000         0.39368         0.43258         0.00001 <td< td=""><td>560</td><td>0.59868</td><td>0.99703</td><td>0.00152</td><td>0.58769</td><td>0.99640</td><td>0.00159</td><td>0.57669</td><td>0.99577</td><td>0.00167</td></td<>	560	0.59868	0.99703	0.00152	0.58769	0.99640	0.00159	0.57669	0.99577	0.00167
570         0.78525         0.97611         0.00058         0.77700         0.97814         0.00061         0.76869         0.98019         0.00064           575         0.87614         0.904645         0.00036         0.86989         0.9970         0.00038         0.86357         0.95286         0.00024           580         0.95742         0.90134         0.00023         0.95556         0.90662         0.00024         0.94862         0.90094         0.0005           585         1.04727         0.86436         0.00014         1.04577         0.86940         0.00015         1.04419         0.87477         0.00016           595         1.14542         0.76101         0.00006         1.14778         0.76708         0.00006         1.15207         0.77321         0.00017           600         1.14641         0.83282         0.00004         1.15909         0.70420         0.00004         1.16403         0.71721         0.00004           610         1.9105         0.56428         0.00002         1.90882         0.59929         0.00002         1.16644         0.57562         0.00003           611         1.01522         0.49780         0.00000         0.39368         0.43258         0.00001 <td< td=""><td>565</td><td>0.68834</td><td>0.99184</td><td>0.00094</td><td>0.67850</td><td>0.99257</td><td>0.00098</td><td>0.66863</td><td>0.99330</td><td>0.00103</td></td<>	565	0.68834	0.99184	0.00094	0.67850	0.99257	0.00098	0.66863	0.99330	0.00103
575         0.87614         0.94645         0.00036         0.86899         0.94970         0.00038         0.86357         0.95296         0.00040           580         0.95742         0.90134         0.00023         0.95566         0.90662         0.00024         0.94862         0.99984         0.00015           585         1.04727         0.86436         0.00014         1.04877         0.86440         0.00015         1.04191         0.87447         0.00016           590         1.14882         0.76101         0.00006         1.14876         0.76708         0.00006         1.15452         0.77321         0.00004           600         1.14616         0.63328         0.00001         1.14739         0.63023         1.00003         1.15417         0.64524         0.00004           610         1.09105         0.65428         0.00002         1.09882         0.56992         0.00002         1.16644         0.57662         0.00002           615         1.116122         0.42787         0.00000         0.12356         0.50322         0.00001         1.03196         0.56633         0.0001           620         0.92219         0.42787         0.00000         0.32933         0.36939         0.00000         <									1	
580         0.95742         0.90134         0.00023         0.95366         0.90562         0.00024         0.94962         0.90994         0.00025           585         1.04727         0.86436         0.00014         1.04577         0.86840         0.00016         1.04419         0.8747         0.00016           595         1.14824         0.76101         0.00006         1.14876         0.76708         0.00006         1.15027         0.77321         0.00007           600         1.15485         0.68922         0.00004         1.14739         0.63323         0.0003         1.14619         0.74220         0.00004         1.16933         0.71023         0.00003           610         1.09105         0.56428         0.00001         1.14739         0.63323         0.0003         1.14619         0.64524         0.00002           611         1.01522         0.49506         0.00001         1.02356         0.50032         0.00001         1.03196         0.56620         0.00002           620         0.92229         0.49787         0.00000         0.39398         0.43285         0.00000         0.34394         0.44780         0.4490         0.00000           620         0.92291         0.3184         0.										
585         1.04727         0.86436         0.00014         1.04577         0.86940         0.00015         1.04419         0.87447         0.00016           590         1.10880         0.81777         0.00009         1.10872         0.82343         0.00010         1.11059         0.82913         0.00010           600         1.15485         0.69822         0.00004         1.15990         0.70420         0.00004         1.16493         0.71023         0.00004           600         1.14061         0.63328         0.00003         1.14739         0.63923         0.00002         1.15417         0.64524         0.00003           610         1.01910         0.56488         0.00002         1.06682         0.00002         1.15417         0.64524         0.00003           615         1.01522         0.49506         0.00001         1.02356         0.50032         0.00001         1.03196         0.50563         0.00001           620         0.92229         0.42787         0.00000         0.93058         0.43258         0.00000         0.33780         0.00000           630         0.6997         0.30184         0.00000         0.7722         0.30548         0.00000         0.43734         0.00000										
590         1,10880         0.81777         0.00009         1,10972         0.82343         0.00010         1,11559         0.82913         0.00010           595         1,14542         0.76101         0.00006         1,15890         0.00004         1,16900         0.00004         1,16930         0.70420         0.00004         1,16493         0.71023         0.00004           605         1,14061         0.63328         0.00003         1,14739         0.63923         0.00003         1,15177         0.64524         0.00003           610         1,09105         0.56428         0.00001         1,02566         0.00001         1,02566         0.00001         1,02560         0.00001         1,02566         0.00001         1,0366         0.00001         1,0366         0.00001         1,0366         0.00001         1,0366         0.00001         1,0366         0.00001         0.000001         0.000001         0.00001 <td></td>										
595         1.14542         0.76101         0.00006         1.14876         0.76708         0.00006         1.15207         0.77321         0.00007           600         1.15485         0.69822         0.00004         1.14990         0.70420         0.00004         1.16493         0.770321         0.00004           605         1.14061         0.63328         0.00003         1.14739         0.63923         0.00004         1.16644         0.57562         0.00002           610         1.09105         0.56428         0.00002         1.09882         0.56992         0.00002         1.10664         0.57562         0.00002           615         1.01522         0.49506         0.00001         1.03566         0.50032         0.00001         1.3396         0.50563         0.00001           620         0.92229         0.42787         0.00000         0.8353         0.3683         0.00000         0.38393         0.00000         0.38393         0.0000         0.38393         0.00000         0.38393         0.00000         0.38393         0.00000         0.74722         0.30548         0.00000         0.74809         0.00000         0.58561         0.24303         0.00000         0.58561         0.24303         0.00000         0.585										
600         1.15485         0.69822         0.00004         1.15990         0.70420         0.00004         1.16493         0.71023         0.00004           605         1.14061         0.63328         0.00002         1.19392         0.63923         0.00002         1.1664         0.57562         0.00002           610         1.09105         0.56428         0.00002         1.09882         0.56992         0.00001         1.13196         0.55662         0.00001           615         1.01522         0.49506         0.00001         1.02356         0.50032         0.00001         1.03196         0.55663         0.00001           620         0.92229         0.42787         0.00000         0.93358         0.43258         0.00000         0.33384         0.00000           630         0.69979         0.30184         0.00000         0.70722         0.30548         0.00000         0.71472         0.33960         0.00000           635         0.58217         0.24490         0.00000         0.58885         0.24802         0.00000         0.59561         0.25118         0.00000           645         0.33934         0.15693         0.00000         0.39437         0.15906         0.00000         0.39375 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
605         1.14061         0.63328         0.00003         1.14739         0.63923         0.00003         1.15417         0.64524         0.00003           610         1.09105         0.56428         0.00002         1.09882         0.56992         0.00002         1.10664         0.57562         0.00001           615         1.01522         0.49506         0.00001         1.02356         0.50032         0.00001         1.03166         0.50563         0.00001           620         0.92229         0.42787         0.00000         0.93058         0.43258         0.00000         0.93894         0.43734         0.00000           630         0.69979         0.30184         0.00000         0.70722         0.30548         0.00000         0.71472         0.39616         0.00000           635         0.58217         0.24490         0.00000         0.58855         0.24802         0.00000         0.59561         0.25118         0.00000           640         0.47900         0.19702         0.00000         0.34937         0.15960         0.00000         0.39937         0.16123         0.00000           650         0.33986         0.12102         0.00000         0.34937         0.16962         0.1270 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
610         1.09105         0.56428         0.00002         1.09882         0.56992         0.00002         1.10664         0.57562         0.00002           615         1.01522         0.49506         0.00001         1.02356         0.50032         0.00001         1.03196         0.50563         0.00001           620         0.92292         0.42787         0.00000         0.93058         0.43258         0.00000         0.93894         0.43734         0.00000           625         0.82135         0.36623         0.00000         0.36939         0.00000         0.83738         0.37360         0.00000           630         0.68979         0.30184         0.00000         0.70722         0.36848         0.00000         0.71472         0.30916         0.00000           635         0.58217         0.24490         0.00000         0.48491         0.1967         0.00000         0.59511         0.00000           645         0.38943         0.15693         0.00000         0.39437         0.15966         0.00000         0.39937         0.16123         0.00000           650         0.33038         0.12102         0.00000         0.3762         0.12270         0.00000         0.31162         0.12440 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td></td<>									1	
615         1.01522         0.49506         0.00001         1.02356         0.50032         0.00001         1.03196         0.50563         0.00001           620         0.92229         0.42787         0.00000         0.93058         0.43258         0.00000         0.93894         0.43734         0.00000           630         0.69979         0.30184         0.00000         0.70722         0.30548         0.00000         0.74727         0.30916         0.00000           635         0.58217         0.24490         0.00000         0.58885         0.24802         0.00000         0.59561         0.25118         0.00000           640         0.47900         0.19702         0.00000         0.48491         0.19966         0.00000         0.49989         0.20235         0.00000           650         0.330368         0.12102         0.00000         0.39437         0.15906         0.00000         0.39937         1.6123         0.00000           655         0.23091         0.09113         0.00000         0.3762         0.12270         0.00000         0.37120         0.09375         0.00000           665         0.23091         0.09113         0.00000         0.123403         0.09243         0.00000         <										
620         0.92229         0.42787         0.00000         0.93058         0.43258         0.00000         0.93894         0.43734         0.00000           625         0.82135         0.36523         0.00000         0.82933         0.36939         0.00000         0.83738         0.37360         0.00000           635         0.58217         0.24490         0.00000         0.58885         0.24802         0.00000         0.71472         0.30518         0.00000           640         0.47900         0.19702         0.00000         0.48491         0.19967         0.00000         0.49089         0.20235         0.00000           645         0.33943         0.15693         0.00000         0.39437         0.15906         0.00000         0.39937         0.16123         0.00000           655         0.23991         0.99113         0.00000         0.30762         0.12270         0.00000         0.31162         0.12440         0.00000           655         0.23991         0.99113         0.00000         0.23433         0.99243         0.00000         0.17801         0.06970         0.0000           665         0.12816         0.04973         0.00000         0.17858         0.06870         0.00000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
625         0.82135         0.36523         0.00000         0.82933         0.36939         0.00000         0.83738         0.37360         0.00000           630         0.69979         0.30184         0.00000         0.70722         0.30548         0.00000         0.71472         0.30916         0.00000           635         0.58217         0.24490         0.00000         0.48491         0.19967         0.00000         0.48089         0.22235         0.00000           640         0.47900         0.19702         0.00000         0.34891         0.19967         0.00000         0.49089         0.20235         0.00000           645         0.38943         0.15693         0.00000         0.39437         0.15906         0.00000         0.39377         0.16123         0.00000           650         0.30368         0.12102         0.00000         0.3762         0.12270         0.00000         0.31162         0.12440         0.00000           655         0.23091         0.09113         0.00000         0.17588         0.06870         0.00000         0.17801         0.06771         0.00000         0.17801         0.067971         0.00000         0.17529         0.00000         0.13174         0.05119         0.00000										
630         0.69979         0.30184         0.00000         0.70722         0.30548         0.00000         0.71472         0.30916         0.00000           635         0.58217         0.24490         0.00000         0.58885         0.24802         0.00000         0.59561         0.25118         0.00000           640         0.47900         0.19702         0.00000         0.48491         0.19967         0.00000         0.49089         0.20235         0.00000           650         0.33984         0.15693         0.00000         0.39437         0.15906         0.00000         0.39937         0.16123         0.00000           655         0.23091         0.09113         0.00000         0.23403         0.09243         0.00000         0.23720         0.09375         0.00000           660         0.17319         0.06771         0.00000         0.17858         0.06870         0.00000         0.17801         0.05970         0.00000           665         0.12816         0.04973         0.00000         0.12994         0.05046         0.00000         0.13174         0.05179         0.00000           670         0.09355         0.03613         0.00000         0.04825         0.03666         0.00000         <										
635         0.58217         0.24490         0.00000         0.58885         0.24802         0.00000         0.59561         0.25118         0.00000           640         0.47900         0.19702         0.00000         0.48491         0.19967         0.00000         0.49089         0.20235         0.00000           645         0.38943         0.15693         0.00000         0.39437         0.15906         0.00000         0.39137         0.16123         0.00000           650         0.30368         0.12102         0.00000         0.39437         0.00000         0.31162         0.12440         0.00000           655         0.23991         0.09113         0.00000         0.23403         0.09243         0.00000         0.23720         0.09375         0.00000           660         0.17319         0.06771         0.00000         0.17558         0.06870         0.00000         0.17801         0.05970         0.00000           665         0.12816         0.04973         0.00000         0.17858         0.06870         0.00000         0.17811         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.09485         0.03660         0.00000         0.04824         <									1	
640         0.47900         0.19702         0.00000         0.48491         0.19967         0.00000         0.49089         0.20235         0.00000           645         0.38943         0.15693         0.00000         0.39437         0.15906         0.00000         0.39937         0.16123         0.00000           650         0.30368         0.12102         0.00000         0.30762         0.12270         0.00000         0.31162         0.12440         0.00000           655         0.23091         0.09113         0.00000         0.23403         0.09243         0.00000         0.21720         0.09375         0.00000           660         0.17319         0.06771         0.00000         0.17588         0.06870         0.00000         0.17801         0.06970         0.00000           665         0.12816         0.04973         0.00000         0.12994         0.05046         0.00000         0.13174         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.04845         0.03666         0.00000         0.09616         0.03719         0.00000           675         0.06734         0.02593         0.00000         0.03826         0.02600         0.05822         <										
645         0.38943         0.15693         0.00000         0.39437         0.15906         0.00000         0.39937         0.16123         0.00000           650         0.30368         0.12102         0.00000         0.30762         0.12270         0.00000         0.31162         0.12440         0.00000           655         0.23091         0.09113         0.00000         0.23403         0.09243         0.00000         0.23720         0.09375         0.00000           660         0.17319         0.06771         0.00000         0.17558         0.06870         0.00000         0.13174         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.09485         0.03666         0.00000         0.09416         0.03719         0.00000           675         0.06734         0.02593         0.00000         0.06828         0.02630         0.00000         0.06922         0.02668         0.00000           680         0.04777         0.01835         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           685         0.03339         0.01281         0.00000         0.03385         0.01299         0.00000         <									1	
650         0.30368         0.12102         0.00000         0.30762         0.12270         0.00000         0.31162         0.12440         0.00000           655         0.23091         0.09113         0.00000         0.23403         0.09243         0.00000         0.23720         0.09375         0.00000           660         0.17319         0.06771         0.00000         0.17588         0.08670         0.00000         0.17801         0.06970         0.00000           665         0.12816         0.04973         0.00000         0.12994         0.05046         0.00000         0.13174         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.09485         0.03666         0.00000         0.06912         0.00000           675         0.06734         0.02593         0.00000         0.08828         0.02630         0.00000         0.06822         0.02688         0.00000           680         0.04777         0.01835         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           685         0.03339         0.01281         0.00000         0.03260         0.00892         0.00000         0.02369         <										
655         0.23091         0.09113         0.00000         0.23403         0.09243         0.00000         0.23720         0.09375         0.00000           660         0.17319         0.06771         0.00000         0.17558         0.06870         0.00000         0.17801         0.06970         0.00000           665         0.12816         0.04973         0.00000         0.12994         0.05046         0.00000         0.13174         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.09485         0.03666         0.00000         0.09616         0.03719         0.00000           675         0.06734         0.02593         0.00000         0.06828         0.02630         0.00000         0.06922         0.02668         0.00000           680         0.04777         0.01835         0.00000         0.04844         0.01862         0.00000         0.04911         0.01889         0.00000           685         0.03339         0.01281         0.00000         0.03236         0.00892         0.00000         0.02359         0.09055         0.00000           695         0.01598         0.0612         0.00000         0.01228         0.00320         0.00000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
660         0.17319         0.06771         0.00000         0.17558         0.06870         0.00000         0.17801         0.06970         0.00000           665         0.12816         0.04973         0.00000         0.12994         0.05046         0.00000         0.13174         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.09485         0.03666         0.00000         0.09616         0.03719         0.00000           675         0.06734         0.02593         0.00000         0.08828         0.02630         0.00000         0.04981         0.00000         0.04981         0.00000         0.04981         0.00000         0.04981         0.00000         0.04984         0.01862         0.00000         0.03483         0.00000         0.03485         0.01299         0.00000         0.03485         0.01299         0.00000         0.03486         0.01299         0.00000         0.03486         0.01299         0.00000         0.03438         0.01299         0.00000         0.03438         0.01299         0.00000         0.03438         0.00000         0.03438         0.00000         0.03438         0.00000         0.01620         0.00621         0.00000         0.01643         0.00000         0.01620	650	0.30368	0.12102	0.00000	0.30762	0.12270	0.00000	0.31162	0.12440	0.00000
665         0.12816         0.04973         0.00000         0.12994         0.05046         0.00000         0.13174         0.05119         0.00000           670         0.09355         0.03613         0.00000         0.09485         0.03666         0.00000         0.09616         0.03719         0.00000           675         0.06734         0.02593         0.00000         0.06828         0.02630         0.00000         0.06922         0.02668         0.00000           680         0.04777         0.01835         0.00000         0.04844         0.01862         0.00000         0.04911         0.01889         0.00000           685         0.03339         0.01281         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           695         0.01598         0.00612         0.00000         0.01620         0.00621         0.00000         0.01142         0.00000         0.01128         0.00000         0.01144         0.00432         0.00432         0.00432         0.00438         0.00000           700         0.01112         0.00426         0.00000         0.01282         0.00300         0.01414         0.00432         0.00364         0.00000	655	0.23091	0.09113	0.00000	0.23403	0.09243	0.00000	0.23720	0.09375	0.00000
670         0.09355         0.03613         0.00000         0.09485         0.03666         0.00000         0.09616         0.03719         0.00000           675         0.06734         0.02593         0.00000         0.06828         0.02630         0.00000         0.06922         0.02668         0.00000           680         0.04777         0.01835         0.00000         0.04844         0.01862         0.00000         0.04911         0.01889         0.00000           685         0.03339         0.01281         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           690         0.02294         0.00879         0.00000         0.01620         0.00621         0.00000         0.02359         0.00905         0.00000           695         0.01598         0.00612         0.00000         0.01620         0.00621         0.00000         0.01643         0.00630         0.00000           700         0.01112         0.000250         0.00000         0.01728         0.00300         0.00144         0.00432         0.00000         0.00733         0.00000           710         0.00529         0.00203         0.00000         0.00367         0.00141	660	0.17319	0.06771	0.00000	0.17558	0.06870	0.00000	0.17801	0.06970	0.00000
675         0.06734         0.02593         0.00000         0.06828         0.02630         0.00000         0.06922         0.02668         0.00000           680         0.04777         0.01835         0.00000         0.04844         0.01862         0.00000         0.04911         0.01889         0.00000           685         0.03339         0.01281         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           690         0.02294         0.00879         0.00000         0.02326         0.00892         0.00000         0.02359         0.00905         0.00000           695         0.01598         0.00612         0.00000         0.01282         0.00621         0.00000         0.01444         0.0033         0.00000           700         0.01112         0.00426         0.00000         0.01128         0.00432         0.00000         0.01144         0.00438         0.00000           705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00344         0.00000           715         0.00529         0.00203         0.00000         0.00367         0.00141         0.00000 <t< td=""><td>665</td><td>0.12816</td><td>0.04973</td><td>0.00000</td><td>0.12994</td><td>0.05046</td><td>0.00000</td><td>0.13174</td><td>0.05119</td><td>0.00000</td></t<>	665	0.12816	0.04973	0.00000	0.12994	0.05046	0.00000	0.13174	0.05119	0.00000
680         0.04777         0.01835         0.00000         0.04844         0.01862         0.00000         0.04911         0.01889         0.00000           685         0.03339         0.01281         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           690         0.02294         0.00879         0.00000         0.02326         0.00892         0.00000         0.02359         0.00905         0.00000           695         0.01598         0.00612         0.00000         0.01620         0.00621         0.00000         0.01643         0.00630         0.00000           700         0.01112         0.00426         0.00000         0.01128         0.00432         0.00000         0.01144         0.00438         0.00000           705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00367         0.00141         0.00000         0.00544         0.00288         0.00000           715         0.00362         0.00139         0.000000         0.00254         0.00097         0.00000	670	0.09355	0.03613	0.00000	0.09485	0.03666	0.00000	0.09616	0.03719	0.00000
685         0.03339         0.01281         0.00000         0.03385         0.01299         0.00000         0.03432         0.01318         0.00000           690         0.02294         0.00879         0.00000         0.02326         0.00892         0.00000         0.02359         0.00905         0.00000           695         0.01598         0.00612         0.00000         0.01620         0.00621         0.00000         0.01643         0.00630         0.00000           700         0.01112         0.00426         0.00000         0.01128         0.00432         0.00000         0.01144         0.00438         0.00000           705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00366         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00254         0.00097         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         <	675	0.06734	0.02593	0.00000	0.06828	0.02630	0.00000	0.06922	0.02668	0.00000
690         0.02294         0.00879         0.00000         0.02326         0.00892         0.00000         0.02359         0.00905         0.00000           695         0.01598         0.00612         0.00000         0.01620         0.00621         0.00000         0.01643         0.00630         0.00000           700         0.01112         0.00426         0.00000         0.01128         0.00432         0.00000         0.01144         0.00438         0.00000           705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00366         0.00206         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         <	680	0.04777	0.01835	0.00000	0.04844	0.01862	0.00000	0.04911	0.01889	0.00000
695         0.01598         0.00612         0.00000         0.01620         0.00621         0.00000         0.01643         0.00630         0.00000           700         0.01112         0.00426         0.00000         0.01128         0.00432         0.00000         0.01144         0.00438         0.00000           705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00367         0.00141         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         <	685	0.03339	0.01281	0.00000	0.03385	0.01299	0.00000	0.03432	0.01318	0.00000
700         0.01112         0.00426         0.00000         0.01128         0.00432         0.00000         0.01144         0.00438         0.00000           705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00366         0.00206         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00023         0.00000         0.00059         0.00023         0.00000         <	690	0.02294	0.00879	0.00000	0.02326	0.00892	0.00000	0.02359	0.00905	0.00000
705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00536         0.00206         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00059         0.00033         0.00000         0.00068         0.00003         0.00000           740         0.00041         0.00016         0.00000         0.00042         0.00016         0.00000         <	695	0.01598	0.00612	0.00000	0.01620	0.00621	0.00000	0.01643	0.00630	0.00000
705         0.00772         0.00295         0.00000         0.00782         0.00300         0.00000         0.00793         0.00304         0.00000           710         0.00529         0.00203         0.00000         0.00536         0.00206         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00059         0.00033         0.00000         0.00068         0.00003         0.00000           740         0.00041         0.00016         0.00000         0.00042         0.00016         0.00000         <	700	0.01112	0.00426	0.00000	0.01128	0.00432	0.00000	0.01144	0.00438	0.00000
710         0.00529         0.00203         0.00000         0.00536         0.00206         0.00000         0.00544         0.00208         0.00000           715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00059         0.00033         0.00000         0.00068         0.00003         0.00000           740         0.00058         0.00023         0.00000         0.00042         0.00016         0.00000         0.00023         0.00000         0.00042         0.00000         0.00042         0.00016         0.00000         0.00042         0.00000         0.00042         0.00000	705	0.00772	0.00295	0.00000	0.00782		0.00000	0.00793	0.00304	0.00000
715         0.00362         0.00139         0.00000         0.00367         0.00141         0.00000         0.00372         0.00143         0.00000           720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00059         0.00033         0.00000         0.00068         0.00003         0.00000           740         0.00058         0.00023         0.00000         0.00059         0.00023         0.00000         0.00023         0.00000         0.00023         0.00000         0.00042         0.00016         0.00000         0.00023         0.00000         0.00042         0.00016         0.00000         0.00023         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.		1								
720         0.00250         0.00096         0.00000         0.00254         0.00097         0.00000         0.00257         0.00099         0.00000           725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00085         0.00033         0.00000         0.00086         0.00003         0.00000           740         0.00058         0.00023         0.00000         0.00059         0.00023         0.00000         0.00023         0.00000         0.00023         0.00000         0.00023         0.00000         0.00023         0.00000         0.00023         0.00000         0.00002         0.00000         0.00023         0.00000         0.00002         0.00016         0.00000         0.00002         0.00016         0.00000         0.00002         0.00016         0.00000         0.00002         0.00011         0.00000         0.00001         0.00000         0.00001         0.000001         0.00000         0.00001		1								
725         0.00173         0.00066         0.00000         0.00175         0.00067         0.00000         0.00178         0.00068         0.00000           730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00058         0.00033         0.00000         0.00086         0.00033         0.00000           740         0.00058         0.00023         0.00000         0.00059         0.00023         0.00000         0.00006         0.00000         0.00002         0.00000										
730         0.00120         0.00046         0.00000         0.00122         0.00047         0.00000         0.00124         0.00048         0.00000           735         0.00084         0.00032         0.00000         0.00085         0.00033         0.00000         0.00086         0.00033         0.00000           740         0.00058         0.00023         0.00000         0.00023         0.00000         0.00002         0.00000         <										
735         0.00084         0.00032         0.00000         0.00085         0.00033         0.00000         0.00086         0.00033         0.00000           740         0.00058         0.00023         0.00000         0.00059         0.00023         0.00000         0.00060         0.00023         0.00000           745         0.00041         0.00016         0.00000         0.00042         0.00016         0.00000         0.00042         0.00016         0.00000         0.00016         0.00000         0.00016         0.00000         0.00012         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         <		1								
740         0.00058         0.00023         0.00000         0.00059         0.00023         0.00000         0.00060         0.00023         0.00000           745         0.00041         0.00016         0.00000         0.00042         0.00016         0.00000         0.00042         0.00016         0.00000         0.00016         0.00000         0.00016         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00000         0.00001         0.00000										
745         0.00041         0.00016         0.00000         0.00042         0.00016         0.00000         0.00042         0.00016         0.00000           750         0.00029         0.00011         0.00002         0.00011         0.00000         0.00003         0.00012         0.00000           755         0.00021         0.00008         0.00000         0.00021         0.00008         0.00000         0.00021         0.00008         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00000         0.00001         0.00001         0.00001         0.00000         0.00001         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         <										
750         0.00029         0.00011         0.00009         0.00011         0.00000         0.00030         0.00012         0.00000           755         0.00021         0.00008         0.00000         0.00021         0.00008         0.00000         0.00021         0.00008         0.00000         0.00001         0.00008         0.00000         0.00001         0.00000         0.00000         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000		1								
755         0.00021         0.00008         0.00000         0.00021         0.00008         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.										
760         0.00015         0.00006         0.00000         0.00015         0.00006         0.00000         0.00000         0.00001         0.00006         0.00000         0.00015         0.00006         0.00000         0.00001         0.00000         0.00001         0.00000         0.00001         0.00000         0.										
765         0.00010         0.00004         0.00000         0.00011         0.00004         0.00000         0.00001         0.00001         0.00001         0.00000         0.00001         0.00000         0.										
770         0.00008         0.00003         0.00000         0.00008         0.00003         0.00000         0.00003         0.00000         0.										
775 0.00005 0.00002 0.00000 0.00005 0.00002 0.00000 0.00006 0.00002 0.00000										
780   0.00004   0.00002   0.00000   0.00004   0.00002   0.00000   0.00004   0.00002   0.00000										
	780	0.00004	0.00002	0.00000	0.00004	0.00002	0.00000	0.00004	0.00002	0.00000

Table A.6 – Spectral sensitivity data of the individual CMFs (Age group: 52, 57 and 62)

Age group	52				57		62		
Wavelength (nm)	$\overline{x}_7'$	$\overline{y}_7'$	$ar{z}_7'$	$\overline{x}_8'$	$\overline{y}_8'$	$ar{z}_8'$	$\overline{x}_9'$	$\overline{y}_9'$	$ar{z}_9'$
390	0.00269	0.00025	0.01344	0.00238	0.00021	0.01191	0.00186	0.00015	0.00940
395	0.00651	0.00061	0.03256	0.00584	0.00053	0.02934	0.00474	0.00039	0.02394

400 405 410 415 420 425 430 435 440 445 450 455 460 465	0.01549 0.03558 0.07091 0.12162 0.17806 0.22514 0.26969 0.30910 0.34269	0.00143 0.00309 0.00596 0.00994 0.01464 0.01948 0.02525	0.07796 0.18038 0.36183 0.62738 0.92818	0.01415 0.03307 0.06679 0.11629	0.00124 0.00275 0.00536 0.00908	0.07145 0.16814 0.34175 0.60117	0.01186 0.02866 0.05942	0.00096 0.00218 0.00436	0.06025 0.14654 0.30553
410 415 420 425 430 435 440 445 450 455 460 465	0.07091 0.12162 0.17806 0.22514 0.26969 0.30910	0.00596 0.00994 0.01464 0.01948	0.36183 0.62738	0.06679	0.00536	0.34175	0.05942		
415 420 425 430 435 440 445 450 455 460 465	0.12162 0.17806 0.22514 0.26969 0.30910	0.00994 0.01464 0.01948	0.62738					0.00436	0.30553
415 420 425 430 435 440 445 450 455 460 465	0.12162 0.17806 0.22514 0.26969 0.30910	0.00994 0.01464 0.01948	0.62738						
420 425 430 435 440 445 450 455 460 465	0.17806 0.22514 0.26969 0.30910	0.01464 0.01948		0.11020			0.10647	0.00760	0.55268
425 430 435 440 445 450 455 460 465	0.22514 0.26969 0.30910	0.01948	0.92010	0.47402					0.84027
430 435 440 445 450 455 460 465	0.26969 0.30910		4 40004	0.17192	0.01350	0.89771	0.16039	0.01151	
435 440 445 450 455 460 465	0.30910	0.02525	1.18834	0.21920	0.01810	1.15838	0.20783	0.01568	1.10085
440 445 450 455 460 465			1.44123	0.26397	0.02357	1.41162	0.25280	0.02061	1.35394
445 450 455 460 465	0.34269	0.03272	1.67747	0.30524	0.03081	1.65670	0.29736	0.02738	1.61472
450 455 460 465		0.04062	1.88579	0.34067	0.03848	1.87396	0.33616	0.03462	1.84839
455 460 465	0.34583	0.04754	1.93485	0.34616	0.04533	1.93485	0.34610	0.04129	1.93182
460 465	0.33446	0.05480	1.90646	0.33686	0.05254	1.91711	0.34080	0.04839	1.93485
465	0.29861	0.06225	1.74349	0.30213	0.05992	1.76005	0.30832	0.05560	1.78972
	0.26700	0.07416	1.61480	0.27128	0.07162	1.63531	0.27900	0.06687	1.67309
	0.24287	0.09361	1.53631	0.24789	0.09070	1.56114	0.25712	0.08524	1.60780
470	0.20041	0.11558	1.35563	0.20529	0.11221	1.38024	0.21425	0.10585	1.42686
475	0.14586	0.13803	1.09483	0.15014	0.13437	1.11770	0.15801	0.12740	1.16147
1									
480	0.09387	0.16216	0.83486	0.09715	0.15820	0.85418	0.10306	0.15061	0.89141
485	0.05328	0.18869	0.62584	0.05547	0.18443	0.64157	0.05926	0.17623	0.67207
490	0.02324	0.21885	0.45985	0.02431	0.21426	0.47222	0.02587	0.20538	0.49630
495	0.00462	0.26394	0.35081	0.00459	0.25883	0.36086	0.00389	0.24890	0.38052
500	-0.00548	0.32434	0.27003	-0.00675	0.31851	0.27817	-0.01003	0.30711	0.29416
505	-0.01074	0.40090	0.19676	-0.01348	0.39434	0.20304	-0.01985	0.38144	0.21542
510	-0.00612	0.49151	0.13567	-0.01055	0.48439	0.14028	-0.02051	0.47025	0.14939
515	0.01395	0.59049	0.09625	0.00777	0.58304	0.09971	-0.00598	0.56809	0.10659
520	0.04328	0.68706	0.06604	0.03543	0.67935	0.06852	0.01803	0.66372	0.07345
525	0.08466	0.76458	0.04411	0.07541	0.75705	0.04583	0.05493	0.74165	0.04927
530	0.13500	0.70438	0.02883	0.07341	0.73703	0.03000	0.03493	0.80820	0.04927
535									
1	0.19022	0.88180	0.01861	0.17896	0.87537	0.01939	0.15390	0.86180	0.02096
540	0.25690	0.93299	0.01177	0.24495	0.92749	0.01228	0.21819	0.91556	0.01331
545	0.32678	0.96471	0.00737	0.31457	0.96036	0.00770	0.28702	0.95056	0.00837
550	0.39690	0.97758	0.00458	0.38488	0.97453	0.00480	0.35745	0.96716	0.00523
555	0.47736	0.99337	0.00283	0.46570	0.99165	0.00297	0.43872	0.98677	0.00324
560	0.56568	0.99516	0.00175	0.55467	0.99456	0.00184	0.52876	0.99179	0.00201
565	0.65873	0.99405	0.00109	0.64879	0.99481	0.00114	0.62476	0.99464	0.00125
570	0.76032	0.98225	0.00067	0.75190	0.98433	0.00071	0.73065	0.98669	0.00078
575	0.85718	0.95624	0.00042	0.85071	0.95955	0.00044	0.83318	0.96430	0.00049
580	0.94561	0.91428	0.00027	0.94151	0.91866	0.00028	0.92862	0.92552	0.00031
585	1.04254	0.87959	0.00017	1.04082	0.88474	0.00018	1.03256	0.89314	0.00020
590	1.11140	0.83487	0.00017	1.11215	0.84067	0.00010	1.10882	0.85038	0.00020
595	1.15534	0.77939	0.00007	1.15858	0.78563	0.00007	1.16028	0.79628	0.00008
600	1.16994	0.71633	0.00005	1.17494	0.72248	0.00005	1.18037	0.73305	0.00005
605	1.16097	0.65131	0.00003	1.16778	0.65744	0.00003	1.17706	0.66809	0.00004
610	1.11448	0.58138	0.00002	1.12237	0.58721	0.00002	1.13412	0.59737	0.00002
615	1.04041	0.51100	0.00001	1.04892	0.51643	0.00001	1.06229	0.52597	0.00002
620	0.94736	0.44215	0.00000	0.95585	0.44702	0.00000	0.96961	0.45559	0.00000
625	0.84550	0.37786	0.00000	0.85370	0.38217	0.00000	0.86727	0.38977	0.00000
630	0.72230	0.31290	0.00000	0.72995	0.31667	0.00000	0.74289	0.32338	0.00000
635	0.60245	0.25438	0.00000	0.60935	0.25762	0.00000	0.62122	0.26341	0.00000
640	0.49694	0.20507	0.00000	0.50306	0.20782	0.00000	0.51372	0.21277	0.00000
645	0.40443	0.16343	0.00000	0.40956	0.16566	0.00000	0.41853	0.16966	0.00000
650	0.40443	0.10343	0.00000	0.40936	0.10300	0.00000	0.41633	0.13101	0.00000
655	0.24040	0.09510	0.00000	0.24365	0.09646	0.00000	0.24940	0.09891	0.00000
660	0.18047	0.07071	0.00000	0.18296	0.07174	0.00000	0.18738	0.07359	0.00000
665	0.13356	0.05193	0.00000	0.13541	0.05268	0.00000	0.13870	0.05405	0.00000
670	0.09750	0.03773	0.00000	0.09885	0.03828	0.00000	0.10125	0.03926	0.00000
675	0.07019	0.02707	0.00000	0.07116	0.02746	0.00000	0.07289	0.02817	0.00000
680	0.04979	0.01916	0.00000	0.05049	0.01944	0.00000	0.05172	0.01994	0.00000
685	0.03480	0.01337	0.00000	0.03528	0.01356	0.00000	0.03615	0.01391	0.00000
690	0.02392	0.00918	0.00000	0.02425	0.00931	0.00000	0.02484	0.00955	0.00000
695	0.01665	0.00639	0.00000	0.01689	0.00648	0.00000	0.01730	0.00665	0.00000
700	0.01159	0.00445	0.00000	0.01176	0.00451	0.00000	0.01204	0.00463	0.00000
705	0.00804	0.00309	0.00000	0.00816	0.00313	0.00000	0.00835	0.00321	0.00000
	0.00551	0.00309		0.00510		0.00000			
710			0.00000		0.00215		0.00573	0.00220	0.00000
715	0.00377	0.00145	0.00000	0.00383	0.00147	0.00000	0.00392	0.00151	0.00000
720	0.00261	0.00100	0.00000	0.00264	0.00102	0.00000	0.00271	0.00104	0.00000
725	0.00180	0.00069	0.00000	0.00183	0.00070	0.00000	0.00187	0.00072	0.00000
730	0.00125	0.00048	0.00000	0.00127	0.00049	0.00000	0.00130	0.00050	0.00000
735	0.00087	0.00034	0.00000	0.00089	0.00034	0.00000	0.00091	0.00035	0.00000
740	0.00061	0.00024	0.00000	0.00062	0.00024	0.00000	0.00063	0.00025	0.00000

745	0.00043	0.00017	0.00000	0.00044	0.00017	0.00000	0.00045	0.00017	0.00000
750	0.00030	0.00012	0.00000	0.00031	0.00012	0.00000	0.00031	0.00012	0.00000
755	0.00021	0.00008	0.00000	0.00022	0.00008	0.00000	0.00022	0.00009	0.00000
760	0.00015	0.00006	0.00000	0.00015	0.00006	0.00000	0.00016	0.00006	0.00000
765	0.00011	0.00004	0.00000	0.00011	0.00004	0.00000	0.00011	0.00004	0.00000
770	0.00008	0.00003	0.00000	0.00008	0.00003	0.00000	0.00008	0.00003	0.00000
775	0.00006	0.00002	0.00000	0.00006	0.00002	0.00000	0.00006	0.00002	0.00000
780	0.00004	0.00002	0.00000	0.00004	0.00002	0.00000	0.00004	0.00002	0.00000

# Table A.7 – Spectral sensitivity data of the individual CMFs (Age group: 67, 72 and 77)

•		•			· · · · · · · · · · · · · · · · · · ·				
Age group		67	I		72	1		77	ı
Wavelength (nm)	$\overline{x}'_{10}$	$\overline{y}_{10}'$	$\bar{z}'_{10}$	$\overline{x}'_{11}$	$\overline{y}'_{11}$	$ar{z}_{11}'$	$\overline{x}'_{12}$	$\overline{y}_{12}'$	$\overline{z}_{12}'$
390	0.00121	0.00008	0.00616	0.00079	0.00005	0.00403	0.00051	0.00003	0.00264
395	0.00325	0.00023	0.01659	0.00224	0.00014	0.01150	0.00154	0.00008	0.00797
400	0.00862	0.00061	0.04420	0.00628	0.00038	0.03243	0.00458	0.00024	0.02379
405	0.02208	0.00146	0.11378	0.01703	0.00098	0.08835	0.01315	0.00065	0.06860
410	0.04787	0.00306	0.24790	0.03862	0.00215	0.20114	0.03119	0.00149	0.16320
415	0.09013	0.00559	0.47053	0.07638	0.00412	0.40060	0.06478	0.00301	0.34106
420	0.14021	0.00874	0.73790	0.12269	0.00664	0.64800	0.10744	0.00501	0.56906
425	0.18673	0.01223	0.99238	0.16792	0.00954	0.89460	0.15112	0.00739	0.80645
430	0.23106	0.01635	1.24010	0.21134	0.01297	1.13583	0.19344	0.01021	1.04033
435	0.27981	0.02234	1.52048	0.26345	0.01823	1.43173	0.24821	0.01476	1.34817
440	0.32328	0.02885	1.77667	0.31105	0.02404	1.70774	0.29948	0.01988	1.64148
445	0.34037	0.03514	1.89624	0.33486	0.02992	1.86131	0.32966	0.02527	1.82703
450	0.34193	0.04197	1.93485	0.34317	0.03641	1.93485	0.34465	0.03134	1.93485
455	0.31385	0.04886	1.81302	0.31958	0.04294	1.83663	0.32567	0.03745	1.86055
460	0.28766	0.05939	1.71287	0.29669	0.05275	1.75359	0.30631	0.04650	1.79528
465	0.26880	0.07657	1.66489	0.28115	0.06880	1.72401	0.29447	0.06134	1.78522
470	0.22619	0.09569	1.48718	0.23899	0.08653	1.55005	0.25303	0.07764	1.61558
475	0.16899	0.11619	1.22146	0.18106	0.10600	1.28455	0.19469	0.09595	1.35089
480	0.11156	0.13835	0.94434	0.12131	0.12711	1.00042	0.13281	0.11589	1.05982
485	0.06480	0.16290	0.71663	0.07170	0.15062	0.76414	0.08050	0.13819	0.81481
490	0.00400	0.10290	0.53223	0.07170	0.17747	0.57076	0.03751	0.16372	0.61208
495	0.00266	0.13030	0.41040	0.00302	0.17747	0.44263	0.00562	0.20169	0.47738
500	-0.01534	0.28835	0.31881	-0.01886	0.27079	0.34553	-0.01987	0.25234	0.47730
505	-0.03019	0.36010	0.23481	-0.03851	0.27079	0.25594	-0.01987	0.23234	0.37449
510	-0.03680	0.44675	0.16390	-0.05089	0.42450	0.23394	-0.06198	0.40026	0.27697
515	-0.03868	0.54309	0.10390	-0.03089	0.42430	0.17982	-0.06630	0.49272	0.19728
520		0.63748	0.08151	-0.04906		0.12999		0.49272	0.14334
525	-0.01091 0.02059	0.03746	0.05494	-0.03744	0.61240	0.09043	-0.06082 -0.04041	0.66149	0.10037
					0.69070				
530	0.06260	0.78350	0.03625	0.02589	0.75970	0.04062	-0.00830	0.73097	0.04552
535	0.11131	0.83867	0.02358	0.07077	0.81633	0.02653	0.03226	0.78847	0.02985
540	0.17238	0.89513	0.01505	0.12832	0.87532	0.01701	0.08560	0.84937	0.01924
545	0.23949	0.93364	0.00951	0.19333	0.91720	0.01081	0.14766	0.89413	0.01228
550	0.30975	0.95433	0.00597	0.26300	0.94185	0.00682	0.21578	0.92238	0.00778
555	0.39141	0.97813	0.00372	0.34461	0.96976	0.00427	0.29628	0.95407	0.00490
560	0.48297	0.98676	0.00232	0.43733	0.98194	0.00267	0.38907	0.96963	0.00308
565	0.58187	0.99404	0.00145	0.53871	0.99363	0.00168	0.49169	0.98558	0.00194
570	0.69225	0.99047	0.00091	0.65322	0.99443	0.00106	0.60902	0.99074	0.00123
575	0.80099	0.97223	0.00057	0.76788	0.98039	0.00067	0.72835	0.98102	0.00078
580	0.90433	0.93716	0.00036	0.87894	0.94909	0.00043	0.84601	0.95378	0.00050
585	1.01625	0.90747	0.00023	0.99882	0.92218	0.00027	0.97278	0.92992	0.00032
590	1.10108	0.86705	0.00015	1.09230	0.88416	0.00018	1.07416	0.89468	0.00021
595	1.16143	0.81466	0.00010	1.16172	0.83356	0.00012	1.15219	0.84633	0.00014
600	1.18821	0.75131	0.00006	1.19544	0.77013	0.00008	1.19278	0.78333	0.00009
605	1.19184	0.68653	0.00004	1.20630	0.70556	0.00005	1.21101	0.71953	0.00006
610	1.15345	0.61501	0.00003	1.17274	0.63324	0.00003	1.18275	0.64696	0.00004
615	1.08470	0.54255	0.00002	1.10731	0.55970	0.00002	1.12135	0.57293	0.00003
620	0.99289	0.47050	0.00000	1.01653	0.48594	0.00000	1.03246	0.49801	0.00000
625	0.89042	0.40303	0.00000	0.91404	0.41676	0.00000	0.93087	0.42762	0.00000
630	0.76510	0.33509	0.00000	0.78788	0.34725	0.00000	0.80493	0.35706	0.00000
635	0.64171	0.27355	0.00000	0.66280	0.28409	0.00000	0.67920	0.29275	0.00000
	0.04171								
640	0.53221	0.22144	0.00000	0.55132	0.23048	0.00000	0.56663	0.23803	0.00000
640 645				0.55132 0.45029	0.23048 0.18400	0.00000	0.56663 0.46337	0.23803 0.19014	0.00000

655	0.25944	0.10324	0.00000	0.26987	0.10775	0.00000	0.27852	0.11159	0.00000
660	0.19512	0.07687	0.00000	0.20317	0.08028	0.00000	0.20989	0.08320	0.00000
665	0.14445	0.05644	0.00000	0.15043	0.05895	0.00000	0.15543	0.06109	0.00000
670	0.10546	0.04100	0.00000	0.10984	0.04282	0.00000	0.11350	0.04437	0.00000
675	0.07593	0.02942	0.00000	0.07908	0.03072	0.00000	0.08172	0.03183	0.00000
680	0.05387	0.02082	0.00000	0.05611	0.02174	0.00000	0.05799	0.02253	0.00000
685	0.03765	0.01453	0.00000	0.03922	0.01517	0.00000	0.04053	0.01572	0.00000
690	0.02588	0.00997	0.00000	0.02695	0.01042	0.00000	0.02786	0.01079	0.00000
695	0.01802	0.00694	0.00000	0.01877	0.00725	0.00000	0.01940	0.00751	0.00000
700	0.01255	0.00483	0.00000	0.01307	0.00505	0.00000	0.01351	0.00523	0.00000
705	0.00870	0.00335	0.00000	0.00907	0.00350	0.00000	0.00937	0.00363	0.00000
710	0.00596	0.00230	0.00000	0.00621	0.00240	0.00000	0.00642	0.00249	0.00000
715	0.00408	0.00157	0.00000	0.00425	0.00164	0.00000	0.00440	0.00170	0.00000
720	0.00282	0.00109	0.00000	0.00294	0.00114	0.00000	0.00304	0.00118	0.00000
725	0.00195	0.00075	0.00000	0.00203	0.00079	0.00000	0.00210	0.00082	0.00000
730	0.00136	0.00053	0.00000	0.00141	0.00055	0.00000	0.00146	0.00057	0.00000
735	0.00095	0.00037	0.00000	0.00099	0.00038	0.00000	0.00102	0.00040	0.00000
740	0.00066	0.00026	0.00000	0.00069	0.00027	0.00000	0.00071	0.00028	0.00000
745	0.00046	0.00018	0.00000	0.00048	0.00019	0.00000	0.00050	0.00020	0.00000
750	0.00033	0.00013	0.00000	0.00034	0.00013	0.00000	0.00035	0.00014	0.00000
755	0.00023	0.00009	0.00000	0.00024	0.00009	0.00000	0.00025	0.00010	0.00000
760	0.00016	0.00006	0.00000	0.00017	0.00007	0.00000	0.00018	0.00007	0.00000
765	0.00012	0.00005	0.00000	0.00012	0.00005	0.00000	0.00013	0.00005	0.00000
770	0.00008	0.00003	0.00000	0.00009	0.00003	0.00000	0.00009	0.00004	0.00000
775	0.00006	0.00002	0.00000	0.00006	0.00003	0.00000	0.00007	0.00003	0.00000
780	0.00004	0.00002	0.00000	0.00005	0.00002	0.00000	0.00005	0.00002	0.00000

# Annex B (informative)

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# Reference colour SPDs data

Table B.1 shows CIE daylight D65 illuminant, seven reference colours, Macbeth white, red, green, blue, cyan, magenta, and yellow SPDs.

These data are provided by the Munsell Colour Science Laboratory (URL: http://www.cis.rit.edu/research/mcsl2/online/cie.php).

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# Table B.1 - Relative SPDs of CIE daylight D65 illuminant and seven reference colours

				Refere	nce colour (i :	= 1 ~ 7)		
Wavelength	D65	1	2	3	4	5	6	7
(nm)	D00	Macbeth White	Macbeth Red	Macbeth Green	Macbeth Blue	Macbeth Cyan	Macbeth Magenta	Macbeth Yellow
380	49.9755	0.153	0.052	0.055	0.069	0.093	0.118	0.054
385	52.3118	0.189	0.052	0.056	0.081	0.11	0.142	0.053
390	54.6482	0.245	0.052	0.057	0.096	0.134	0.179	0.054
395	68.7015	0.319	0.052	0.058	0.114	0.164	0.228	0.053
400	82.7549	0.409	0.051	0.058	0.136	0.195	0.283	0.053
405	87.1204	0.536	0.051	0.058	0.156	0.22	0.322	0.053
410	91.486	0.671	0.05	0.059	0.175	0.238	0.343	0.053
415	92.4589	0.772	0.05	0.059	0.193	0.249	0.354	0.052
420	93.4318	0.84	0.049	0.059	0.208	0.258	0.359	0.052
425	90.057	0.868	0.049	0.06	0.224	0.27	0.357	0.052
430	86.6823	0.878	0.049	0.062	0.244	0.281	0.35	0.053
435	95.7736	0.882	0.049	0.063	0.265	0.296	0.339	0.053
440	104.865	0.883	0.049	0.065	0.29	0.315	0.327	0.053
445	110.936	0.885	0.049	0.067	0.316	0.334	0.313	0.054
450	117.008	0.886	0.049	0.07	0.335	0.352	0.298	0.055
455	117.41	0.886	0.048	0.074	0.342	0.37	0.282	0.056
460	117.812	0.887	0.048	0.078	0.338	0.391	0.267	0.059
465	116.336	0.888	0.047	0.084	0.324	0.414	0.253	0.065
470	114.861	0.888	0.047	0.091	0.302	0.434	0.239	0.075
475	115.392	0.888	0.046	0.101	0.273	0.449	0.225	0.093
480	115.923	0.888	0.045	0.113	0.239	0.458	0.209	0.121
485	112.367	0.888	0.045	0.125	0.205	0.461	0.195	0.157
490	108.811	0.888	0.044	0.14	0.172	0.457	0.182	0.202
495	109.082	0.888	0.044	0.157	0.144	0.447	0.172	0.252
500	109.354	0.887	0.044	0.18	0.12	0.433	0.163	0.303
505	108.578	0.887	0.044	0.208	0.101	0.414	0.155	0.351
510	107.802	0.887	0.044	0.244	0.086	0.392	0.146	0.394
515	106.296	0.887	0.044	0.286	0.074	0.366	0.135	0.436
520	104.79	0.887	0.044	0.324	0.066	0.339	0.124	0.475
525	106.239	0.887	0.044	0.351	0.059	0.31	0.113	0.512

530	107.689	0.887	0.044	0.363	0.054	0.282	0.106	0.544
535	106.047	0.887	0.044	0.363	0.051	0.255	0.102	0.572
540	104.405	0.887	0.045	0.355	0.048	0.228	0.102	0.597
545	104.225	0.886	0.046	0.342	0.046	0.204	0.105	0.615
550	104.046	0.886	0.047	0.323	0.045	0.18	0.107	0.63
555	102.023	0.887	0.048	0.303	0.044	0.159	0.107	0.645
560	100	0.887	0.05	0.281	0.043	0.141	0.106	0.66
565	98.1671	0.887	0.053	0.26	0.042	0.126	0.107	0.673
570	96.3342	0.888	0.057	0.238	0.041	0.114	0.112	0.686
575	96.0611	0.888	0.063	0.217	0.041	0.104	0.123	0.698
580	95.788	0.887	0.072	0.196	0.04	0.097	0.141	0.708
585	92.2368	0.886	0.086	0.177	0.04	0.092	0.166	0.718
590	88.6856	0.886	0.109	0.158	0.04	0.088	0.198	0.726
595	89.3459	0.886	0.143	0.14	0.04	0.083	0.235	0.732
600	90.0062	0.887	0.192	0.124	0.039	0.08	0.279	0.737
605	89.8026	0.888	0.256	0.111	0.039	0.077	0.333	0.742
610	89.5991	0.889	0.332	0.101	0.04	0.075	0.394	0.746
615	88.6489	0.89	0.413	0.094	0.04	0.074	0.46	0.749
620	87.6987	0.891	0.486	0.089	0.04	0.073	0.522	0.753
625	85.4936	0.891	0.55	0.086	0.04	0.073	0.58	0.757
630	83.2886	0.891	0.598	0.084	0.041	0.073	0.628	0.761
635	83.4939	0.891	0.631	0.082	0.041	0.073	0.666	0.765
640	83.6992	0.89	0.654	0.08	0.042	0.073	0.696	0.768
645	81.863	0.889	0.672	0.078	0.042	0.073	0.722	0.772
650	80.0268	0.889	0.686	0.077	0.042	0.074	0.742	0.777
655	80.1207	0.889	0.694	0.076	0.043	0.075	0.756	0.779
660	80.2146	0.889	0.7	0.075	0.043	0.076	0.766	0.78
665	81.2462	0.889	0.704	0.075	0.043	0.076	0.774	0.78
670	82.2778	0.888	0.707	0.075	0.044	0.077	0.78	0.781
675	80.281	0.888	0.712	0.077	0.044	0.076	0.785	0.782
680	78.2842	0.888	0.718	0.078	0.044	0.075	0.791	0.785
685	74.0027	0.888	0.721	0.08	0.044	0.074	0.794	0.785
690	69.7213	0.888	0.724	0.082	0.045	0.074	0.798	0.787
695	70.6652	0.888	0.727	0.085	0.046	0.073	0.801	0.789
700	71.6091	0.888	0.729	0.088	0.048	0.072	0.804	0.792
705	72.979	0.887	0.73	0.089	0.05	0.072	0.806	0.792
710	74.349	0.886	0.73	0.089	0.051	0.071	0.807	0.793
715	67.9765	0.886	0.729	0.09	0.053	0.073	0.807	0.792
720	61.604	0.886	0.727	0.09	0.056	0.075	0.807	0.79
725	65.7448	0.885	0.728	0.09	0.06	0.078	0.81	0.792
730	69.8856	0.885	0.729	0.089	0.064	0.082	0.813	0.792
735	72.4863	0.885	0.729	0.092	0.07	0.09	0.814	0.79
740	75.087	0.884	0.727	0.094	0.079	0.1	0.813	0.787
745	69.3398	0.884	0.723	0.097	0.091	0.116	0.81	0.782
750	63.5927	0.883	0.721	0.102	0.104	0.133	0.808	0.778

755	55.0054	0.882	0.724	0.106	0.12	0.154	0.811	0.78
760	46.4182	0.882	0.728	0.11	0.138	0.176	0.814	0.782
765	56.6118	0.881	0.727	0.111	0.154	0.191	0.813	0.781
770	66.8054	0.88	0.702	0.112	0.168	0.2	0.785	0.752
775	65.0941	0.88	0.68	0.112	0.186	0.208	0.765	0.728
780	63.3828	0.879	0.664	0.112	0.204	0.214	0.752	0.71

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Table B.2 shows the XYZ data converted from the SPDs data in Table B.1. Reference colours, CIE D65 illuminant, and CIE 1931 standard colorimetric observer were applied.

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Table B.2 – Reference XYZ values using CIE 1931 standard colorimetric observer

		X	Υ	Z
Refe	rence white	0.9504	1.0000	1.0885
	Macbeth white	0.8413	0.8873	0.9536
	Macbeth red	0.2020	0.1185	0.0520
	Macbeth green	0.1451	0.2355	0.0954
Reference colour	Macbeth blue	0.0840	0.0624	0.2993
Coloui	Macbeth cyan	0.1449	0.1988	0.3951
	Macbeth magenta	0.2944	0.1930	0.3026
	Macbeth yellow	0.5605	0.5962	0.0959

539 Annex C 540 (informative)

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### Measurement method of observer metamerism between different displays

#### C.1 General

Evaluating the colour difference of several observations using a reference colour is an important part of evaluating the performance of a display. However, when it is necessary to evaluate the observer colour difference between different displays, a direct comparison between each display is required. This annex describes the process for evaluating the OMI between different displays.

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#### C.2 Reference colours and measurement method

In order to evaluate the observer-dependent colour properties of two different displays, two displays are defined as DUT A and DUT B. The reference colours are the same as in the main body. The standard set-up condition and measuring condition are also the same as subclause 6.3. Measurement process is as follows.

- a) Carry out the steps 1) to 7) in 6.3.3 with the DUT A to obtain XYZ tristimulus values for each individual observer.
- b) Repeat the process a) with the DUT B.
- 558 c) Calculate the CIE DE2000  $\Delta E_{00}$  between the DUT A and the DUT B for each individual observer as described in 6.3.3 9).
- d) Repeat the process a) to c) for each reference colour.
- e) Report observer metamerism indices using the reporting form in Table 1.

562 Annex D 563 (informative)

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## Colour-matching process for multi-ORU DUTs

If the DUT has more than three ORUs (i.e. multi-ORU DUT such as RGBW, RGBY etc.), and the multi-ORU rendering algorithm is unknown, calculate the test SPD match as follows.

- a) Perform adjustment of input RGB signals for the DUT until the colour difference between reference colour and the initial test colour becomes smaller than 1.0 in CIE  $\Delta E_{00}$ .
- b) Measure the SPD of the initial test colour that was adjusted at step a) and calculate XYZ of the initial test colour.
- Select the most three significant ORUs for the DUT. If the ORUs include R, G and B, those are recommended.
- 574 d) Solve the weighting factors of three significant ORUs using following equation.

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$$\begin{bmatrix} X_{r(i,j)} \\ Y_{r(i,j)} \\ Z_{r(i,j)} \end{bmatrix} = \begin{bmatrix} X_{t(i,j),n} \\ Y_{t(i,j),n} \\ Z_{t(i,j),n} \end{bmatrix} + \begin{bmatrix} X_{1(j)} & X_{2(j)} & X_{3(j)} \\ Y_{1(j)} & Y_{2(j)} & Y_{3(j)} \\ Z_{1(j)} & Z_{2(j)} & Z_{3(j)} \end{bmatrix} \cdot \begin{bmatrix} w_{1(i,j)} \\ w_{2(i,j)} \\ w_{3(i,j)} \end{bmatrix}$$
(36)

$$\begin{bmatrix} w_{1(i,j)} \\ w_{2(i,j)} \\ w_{3(i,j)} \end{bmatrix} = \begin{bmatrix} X_{1(j)}^{'} & X_{2(j)}^{'} & X_{3(j)}^{'} \\ Y_{1(j)}^{'} & Y_{2(j)}^{'} & Y_{3(j)}^{'} \\ Z_{1(j)}^{'} & Z_{2(j)}^{'} & Z_{3(j)}^{'} \end{bmatrix}^{-1} \cdot \begin{bmatrix} X_{r(i,j)}^{'} - X_{t(i,j),n}^{'} \\ Y_{r(i,j)}^{'} - Y_{t(i,j),n}^{'} \\ Z_{r(i,j)}^{'} - Z_{t(i,j),n}^{'} \end{bmatrix}$$
(37)

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 $X_{t(i,j),n}^{'},Y_{t(i,j),n}^{'}$  and  $Z_{t(i,j),n}^{'}$  denote the XYZ values of the initial test colour measured in step b);

 $X_{q(j)}'$ ,  $Y_{q(j)}'$  and  $Z_{q(j)}'$  are the XYZ values (q = 1, 2 and 3 which denote three significant ORUs) calculated in step b), which are of *i*th reference colour using individual CMFs of *i*th individual observer;

 $w_{q(i,j)}$  is weighting factor calculated from step d), and q also has 1, 2 and 3 for the three significant ORUs.

e) The final test spectral distribution can be obtained as below.

$$\Phi_{t(i,j)}(\lambda) = \Phi_{t(i,j),n}(\lambda) + \begin{bmatrix} w_{1(i,j)} & w_{2(i,j)} & w_{3(i,j)} \end{bmatrix} \cdot \begin{bmatrix} \Phi_{1}(\lambda) & \Phi_{2}(\lambda) & \Phi_{3}(\lambda) \end{bmatrix}^{T}$$
(38)

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 $\Phi_{t(i,j),n}(\lambda)$  is the SPD of the initial test colour measured in step b);

 $\Phi_a(\lambda)$  is the SPD of the significant ORU (q = 1, 2 and 3).

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Note 1: This method can be applied when testers are able to measure the independent SPD of single ORU. If testers are not able to radiate and measure SPD of single ORU, this method cannot be applied.

Note 2: Out-of-gamut chromaticity can be judged by representing them on the CIE 1931 xy chromaticity diagram. Then exclude and report any reference colour patch illuminated by D65 that is outside the DUT chromaticity gamut boundary.

Note 3: It is recommended the luminance is set with an input signal that is 1.2 times higher than the luminance of the match target. After that, the R, G and B input signals are finely adjusted to perform colour matching.

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# 598 Annex E 599 (informative)

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# Working example of observer metamerism index

# E.1 Purpose

This annex aims to provide a working example regarding the measurement and calculation process in 6.3 to the readers of this technical specification.

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#### E.2 DUT

For this annex, an arbitrarily generated display with optical characteristics as shown in Table D.1 below was used. The optical characteristics and R, G, B, W spectra of the display are shown in the Table D.1, Figure D.1 and Table D.6. For convenience of explanation, the used DUT satisfies the additivity law and the gamma was set to 2.2.

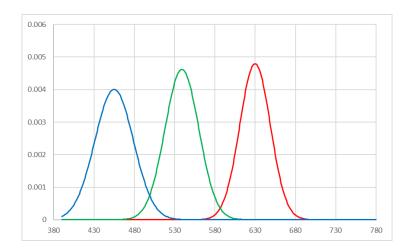
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#### Table D.1 - Optical properties of the DUT

	Х	Y	Z	Х	у
White	190.08	200.00	217.89	0.3126	0.3290
Red	99.31	46.63	0.03	0.6803	0.3195
Green	53.71	140.52	8.92	0.2644	0.6917
Blue	37.05	12.85	208.95	0.1431	0.0496
Gamma			2.2		

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Figure D.1 – RGB primary spectrum of the DUT

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#### E.3 Process

In case the DUT satisfies colour additivity, the SPD of the colour-matched DUT should be obtained by calculating the weighting factors of primary colours SPDs as explained in 6.3.

#### E.3.1 Colour-matching

In the colour matching stage, the goal is to make the colour difference between the reference colour and the test pattern displayed on the DUT as small as possible.

#### E.3.1.1 Reference colour XYZ

Calculate the XYZ value of each reference colour and each individual CMFs using equation (1). In case of the Macbeth white colour (Table B.1) under D65 illuminant and the age group 22's individual CMFs (Table A.4), the result of XYZ is (178.06, 188.95, 196.77). Other XYZ values of the reference colour are listed in Table D.2.

#### Table D.2 - Reference colour XYZ values of age group 22 individual CMFs

Reference colour	X	Υ	Z	
Macbeth white	cbeth white 178.06		196.77	
Macbeth red	42.39	25.43	10.88	
Macbeth green	Macbeth green 31.26		18.55	
Macbeth blue	17.05	14.45	61.83	
Macbeth cyan	30.13	43.33	79.63	
Macbeth magenta	61.91	42.14	65.38	
Macbeth yellow	119.69	124.23	17.85	

# E.3.1.2 Calculating R, G and B weighting factors

Calculate the R, G and B weighting factors of the DUT to match the reference colour and the DUT colour as described in 6.3.3. The R, G and B weighting factors of the matched colour (age group 22) are listed in Table D.3. Refer to the below Table D.7 for the results of the other age groups.

Table D.3 - R, G and B weighting factors of the matched colours (age group 22)

	Weighting factor			
Reference colour	R	G	В	
Macbeth white	0.8889	0.8914	0.8956	
Macbeth red	0.3636	0.0428	0.0497	
Macbeth green	0.1037	0.2953	0.0783	
Macbeth blue	0.0360	0.0511	0.2880	
Macbeth cyan	0.0225	0.2478	0.3657	
Macbeth magenta	0.4293	0.1037	0.3031	
Macbeth yellow	0.7894	0.5808	0.0669	

### E.3.2 Calculating the SPD of the DUT

Calculate the SPD of the test colour which was colour matched in process 5).

#### E.3.3 XYZ computation

Calculate the XYZ values of the matched colour, Macbeth white of DUT using CIE 1931 standard colorimetric observer as shown in equation (10).

#### E.3.4 Colour difference computation

Calculate the CIE DE2000  $\Delta E_{00}$  between the reference colour and the DUT according to equations (15) ~ (35). Reference XYZ data using CIE 1931 standard colorimetric observer are in Table B.2. The OMI calculation result of all 7 reference colours and age groups are listed in Table D.4.

Table D.4 – OMI calculation result of all 7 colours and age groups

	Observer metamerism index						
Age group	Macbeth white	Macbeth red	Macbeth green	Macbeth blue	Macbeth cyan	Macbeth magenta	Macbeth yellow
22	1.22	0.48	0.13	0.12	1.16	1.17	0.04
27	1.02	0.43	0.13	0.12	0.95	1.05	0.15
32	0.87	0.39	0.13	0.11	0.74	0.93	0.27
37	0.78	0.35	0.12	0.11	0.55	0.81	0.39
42	0.77	0.31	0.12	0.10	0.42	0.71	0.51
47	0.83	0.27	0.12	0.10	0.41	0.60	0.63
52	0.94	0.24	0.13	0.11	0.52	0.50	0.76
57	1.09	0.21	0.13	0.11	0.70	0.41	0.88
62	1.40	0.16	0.15	0.12	1.12	0.25	1.12
67	1.97	0.09	0.21	0.15	1.89	0.19	1.55
72	2.52	0.04	0.29	0.18	2.68	0.39	1.97
77	3.06	0.03	0.39	0.22	3.47	0.61	2.41

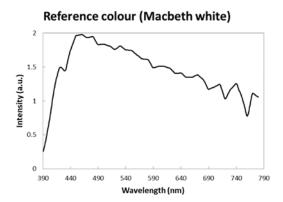
## E.3.5 Reporting

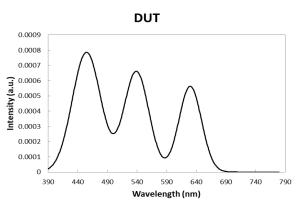
Report maximum, minimum, average and standard deviation of OMI values for each reference colour, and present a pair of graphs showing the spectral plots of metameric pairs of reference colour and DUT colour. Here, one metameric pair of Macbeth white is given as an example.

Table D.5 – Reporting of OMI results

	Observer metamerism index				
Reference colour	Maximum	Minimum	Average	Standard deviation	
Macbeth white	3.06	0.77	1.37	0.75	
Macbeth red	0.48	0.03	0.25	0.15	
Macbeth green	0.39	0.12	0.17	0.09	
Macbeth blue	0.22	0.10	0.13	0.04	
Macbeth cyan	3.47	0.41	1.22	0.98	
Macbeth magenta	1.17	0.19	0.64	0.31	

Macbeth yellow	2.41	0.04	0.89	0.74
Total	3.47	0.03	0.67	0.72





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Table D.6 - R, G, B, W spectra of the DUT

Figure E.2 – Example of graphs of colour-matched metameric pair of reference colour (Macbeth white) and test colour of the DUT

Wavelength (nm)	Red	Green	Blue	White
390	0	0	0.000101	0.000101
391	0	0	0.000114	0.000114
392	0	0	0.000128	0.000128
393	0	0	0.000142	0.000142
394	0	0	0.00016	0.00016
395	0	0	0.000178	0.000178
396	0	0	0.000196	0.000196
397	0	0	0.000215	0.000215
398	0	0	0.000238	0.000238
399	0	0	0.000265	0.000265
400	0	0	0.000288	0.000288
401	0	0	0.00032	0.00032
402	0	0	0.000352	0.000352
403	0	0	0.000384	0.000384
404	0	0	0.00042	0.00042
405	0	0	0.000457	0.000457
406	0	0	0.000498	0.000498
407	0	0	0.000544	0.000544
408	0	0	0.000589	0.000589
409	0	0	0.00064	0.00064

410         0         0         0.00069         0.000           411         0         0         0.000745         0.0007           412         0         0         0.000804         0.0008           413         0         0         0.000868         0.0008           414         0         0         0.000932         0.0008           415         0         0         0.001001         0.0010           416         0         0         0.001069         0.0010           417         0         0         0.00142         0.001           418         0         0         0.001302         0.0013           419         0         0         0.00132         0.0013           420         0         0         0.001344         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001467         0.0014           422         0         0         0.001467         0.0014           423         0         0         0.001465         0.0016           424         0         0         0.001832         0.0016	
412         0         0         0.000804         0.0008           413         0         0         0.000868         0.0008           414         0         0         0.000932         0.0008           415         0         0         0.001001         0.0010           416         0         0         0.001069         0.0011           417         0         0         0.001142         0.0011           418         0         0         0.00122         0.001           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001832         0.0018           427         0         0         0.00223         0.002	69
413         0         0         0.000868         0.0008           414         0         0         0.000932         0.0008           415         0         0         0.001001         0.0010           416         0         0         0.001069         0.0010           417         0         0         0.001142         0.0011           418         0         0         0.001322         0.001           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001467         0.0014           423         0         0         0.001645         0.0016           424         0         0         0.001645         0.0016           424         0         0         0.001832         0.0016           425         0         0         0.001832         0.0016           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0020 <td>745</td>	745
414         0         0         0.000932         0.0008           415         0         0         0.001001         0.0010           416         0         0         0.001069         0.0010           417         0         0         0.001142         0.0011           418         0         0         0.00132         0.0013           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0015           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0018           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0020           430         0         0         0.00233         0.002	804
415         0         0         0.001001         0.00106           416         0         0         0.001069         0.0010           417         0         0         0.001142         0.0011           418         0         0         0.001322         0.001           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0016           425         0         0         0.001832         0.0016           426         0         0         0.001832         0.0016           427         0         0         0.002029         0.0021           428         0         0         0.002129         0.0021           429         0         0         0.00233         0.002           430         0         0         0.00233         0.002	868
416         0         0         0.001069         0.0010           417         0         0         0.001142         0.0011           418         0         0         0.00122         0.001           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0015           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001832         0.0018           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0020           430         0         0         0.00223         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026	932
417         0         0         0.001142         0.00114           418         0         0         0.00122         0.001           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0018           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00233         0.002           430         0         0         0.00233         0.002           431         0         0         0.002531         0.0024           432         0         0         0.002531         0.0026	001
418         0         0         0.00122         0.001           419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0019           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0024           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002732         0.0026	069
419         0         0         0.001302         0.0013           420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0018           427         0         0         0.002029         0.0026           428         0         0         0.002129         0.0026           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002632         0.0026           434         0         0         0.002632         0.0026	142
420         0         0         0.001384         0.0013           421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0018           427         0         0         0.002029         0.0020           428         0         0         0.00219         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002632         0.0026           434         0         0         0.002833         0.0026           435         0         0         0.002833         0.0026	22
421         0         0         0.001467         0.0014           422         0         0         0.001558         0.0016           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0018           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.00233         0.002           432         0         0         0.002531         0.0026           433         0         0         0.002531         0.0026           434         0         0         0.002732         0.0026           435         0         0         0.002833         0.0026           436         0         0         0.003299         0.0026	302
422         0         0         0.001558         0.0015           423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0019           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.00233         0.002           432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0026           435         0         0         0.002833         0.0026           437         0         0         0.00325         0.0036           438         0         0         0.003294         0.0032	384
423         0         0         0.001645         0.0016           424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0019           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0026           435         0         0         0.002833         0.0026           437         0         0         0.003025         0.0036           438         0         0         0.003297         0.0032           440         0         0         0.003294         0.0032	467
424         0         0         0.001741         0.0017           425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0019           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0026           435         0         0         0.002833         0.0026           436         0         0         0.002833         0.0028           437         0         0         0.003025         0.0030           438         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032	558
425         0         0         0.001832         0.0018           426         0         0         0.001933         0.0019           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0026           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0028           437         0         0         0.003025         0.0030           438         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003459         0.0034	645
426         0         0         0.001933         0.0019           427         0         0         0.002029         0.0020           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0026           435         0         0         0.002833         0.0026           436         0         0         0.002929         0.0028           437         0         0         0.003025         0.0030           438         0         0         0.003207         0.0032           440         0         0         0.003207         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003536         0.0035	741
427         0         0         0.002029         0.00202           428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0028           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003294         0.0032           440         0         0         0.003381         0.0033           441         0         0         0.003459         0.0034           442         0         0         0.003536         0.0035	832
428         0         0         0.002129         0.0021           429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0028           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003294         0.0032           440         0         0         0.003381         0.0033           441         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	933
429         0         0         0.00223         0.002           430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0029           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	029
430         0         0         0.00233         0.002           431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0026           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0029           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003459         0.0034           442         0         0         0.003536         0.0035	129
431         0         0         0.002431         0.0024           432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0029           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	223
432         0         0         0.002531         0.0025           433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0029           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	233
433         0         0         0.002632         0.0026           434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0029           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	431
434         0         0         0.002732         0.0027           435         0         0         0.002833         0.0028           436         0         0         0.002929         0.0029           437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	531
435       0       0       0.002833       0.0028         436       0       0       0.002929       0.0029         437       0       0       0.003025       0.0030         438       0       0       0.003116       0.0031         439       0       0       0.003207       0.0032         440       0       0       0.003294       0.0032         441       0       0       0.003381       0.0033         442       0       0       0.003459       0.0034         443       0       0       0.003536       0.0035	632
436       0       0       0.002929       0.0029         437       0       0       0.003025       0.0030         438       0       0       0.003116       0.0031         439       0       0       0.003207       0.0032         440       0       0       0.003294       0.0032         441       0       0       0.003381       0.0033         442       0       0       0.003459       0.0034         443       0       0       0.003536       0.0035	732
437         0         0         0.003025         0.0030           438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	833
438         0         0         0.003116         0.0031           439         0         0         0.003207         0.0032           440         0         0         0.003294         0.0032           441         0         0         0.003381         0.0033           442         0         0         0.003459         0.0034           443         0         0         0.003536         0.0035	929
439     0     0     0.003207     0.0032       440     0     0     0.003294     0.0032       441     0     0     0.003381     0.0033       442     0     0     0.003459     0.0034       443     0     0     0.003536     0.0035	025
440     0     0     0.003294     0.0032       441     0     0     0.003381     0.0033       442     0     0     0.003459     0.0034       443     0     0     0.003536     0.0035	116
441     0     0     0.003381     0.0033       442     0     0     0.003459     0.0034       443     0     0     0.003536     0.0035	207
442     0     0     0.003459     0.0034       443     0     0     0.003536     0.0035	294
443 0 0 0.003536 0.0035	381
	459
444 0 0 0 000005 000005	536
444 0 0 0.003605 0.0036	605
445 0 0 0.003673 0.0036	673
446 0 0 0.003733 0.0037	733
447 0 0 0.003788 0.0037	788
448 0 0 0.003838 0.0038	838

449         0         0         0.003883         0.003883           450         0         0         0.00392         0.00392           451         0         0         0.003952         0.003952           452         0         0         0.003975         0.003973           453         0         0         0.004002         0.004002           455         0         0         0.004007         0.004007           456         0         0         0.004007         0.004002           457         0         0         0.003993         0.003993           458         0         0         0.003993         0.003993           459         0         0.000006         0.003952         0.003958           460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00383         0.00389           462         0         0.000006         0.003883         0.00389           463         0         0.000006         0.003838         0.003794           464         0         0.000006         0.003733         0.003794           465         0         <		T	T	T	
451         0         0         0.003952         0.003952           452         0         0         0.003975         0.003975           453         0         0         0.003993         0.003993           454         0         0         0.004002         0.004002           455         0         0         0.004007         0.004002           456         0         0         0.004002         0.004002           457         0         0         0.003993         0.003993           458         0         0         0.003975         0.003975           459         0         0.000006         0.00392         0.003926           460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00383         0.00389           462         0         0.000006         0.00383         0.003844           463         0         0.000006         0.003733         0.003794           464         0         0.000006         0.003733         0.003739           465         0         0.000012         0.003605         0.003617           467         0	449	0	0	0.003883	0.003883
452         0         0         0.003975         0.003975           453         0         0         0.003993         0.003993           454         0         0         0.004002         0.004002           455         0         0         0.004007         0.004007           456         0         0         0.004002         0.004002           457         0         0         0.003993         0.003993           458         0         0         0.003952         0.003975           459         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00383         0.00389           462         0         0.000006         0.00383         0.003844           463         0         0.000006         0.003738         0.003794           464         0         0.000006         0.003673         0.00368           465         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003605         0.003617           468         0<	450	0	0	0.00392	0.00392
453         0         0         0.003993         0.003993           454         0         0         0.004002         0.004002           455         0         0         0.004007         0.004007           456         0         0         0.004002         0.004002           457         0         0         0.003993         0.003993           458         0         0         0.003952         0.003975           459         0         0.000006         0.00392         0.003926           460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00383         0.00389           462         0         0.000006         0.00383         0.003844           463         0         0.000006         0.003733         0.003794           464         0         0.000006         0.003673         0.00368           465         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003459         0.003471           468	451	0	0	0.003952	0.003952
454         0         0         0.004002         0.004007         0.004007           455         0         0         0.004007         0.004007         0.004007           456         0         0         0.003993         0.003993         0.003993           457         0         0         0.003975         0.003975         0.003975           458         0         0         0.003952         0.003958         0.003958           460         0         0.000006         0.00392         0.003926         0.00392         0.003926           461         0         0.000006         0.00383         0.003926         0.00392         0.003926         0.00392         0.003926         0.003926         0.00392         0.003926         0.00392         0.003926         0.003926         0.00392         0.003926         0.00392         0.003926         0.003926         0.00392         0.003926         0.003928         0.003928         0.003928         0.003838         0.003838         0.003838         0.003848         0.003844         0.003844         0.003744         0.003744         0.00374         0.00374         0.003673         0.003673         0.003673         0.003673         0.003673         0.003673         0.003673 <td>452</td> <td>0</td> <td>0</td> <td>0.003975</td> <td>0.003975</td>	452	0	0	0.003975	0.003975
455         0         0         0.004007         0.004007           456         0         0         0.004002         0.004002           457         0         0         0.003993         0.003993           458         0         0         0.003975         0.003975           459         0         0.000006         0.00392         0.003926           460         0         0.000006         0.00383         0.00392           461         0         0.000006         0.003883         0.00389           462         0         0.000006         0.003883         0.003844           463         0         0.000006         0.003794         0.003794           464         0         0.000006         0.003733         0.003794           465         0         0.000006         0.003673         0.003794           466         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           4	453	0	0	0.003993	0.003993
456         0         0         0.004002         0.004002         0.004002           457         0         0         0.003993         0.003993         0.003993           458         0         0         0.003975         0.003975         0.003975           459         0         0.000006         0.003952         0.003928         0.003926           460         0         0.000006         0.003883         0.00389           461         0         0.000006         0.003838         0.003844           463         0         0.000006         0.003788         0.003794           464         0         0.000006         0.003733         0.003794           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.00341           469         0         0.000012         0.003459         0.00341           470         0         0.000019         0.003294         0.00341           471         0	454	0	0	0.004002	0.004002
457         0         0         0.003993         0.003993           458         0         0         0.003975         0.003975           459         0         0.000006         0.003952         0.003958           460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00383         0.00389           462         0         0.000006         0.003838         0.003844           463         0         0.000006         0.003788         0.003794           464         0         0.000006         0.003733         0.003794           465         0         0.000006         0.003733         0.003739           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003617           468         0         0.000012         0.003459         0.00341           469         0         0.000012         0.003459         0.00341           470         0         0.000012         0.003381         0.00341           471         0         0.000025         0.003116         0.003131	455	0	0	0.004007	0.004007
458         0         0         0.003975         0.003975           459         0         0.000006         0.003952         0.003958           460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.00383         0.00389           462         0         0.000006         0.003788         0.003794           463         0         0.000006         0.003733         0.003794           464         0         0.000006         0.003673         0.00368           465         0         0.000012         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003294         0.00341           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003116         0.003141	456	0	0	0.004002	0.004002
459         0         0.000006         0.003952         0.003958           460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.003883         0.00389           462         0         0.000006         0.003838         0.003844           463         0         0.000006         0.003788         0.003794           464         0         0.000006         0.003733         0.003739           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003294         0.00341           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003116         0.003141           473         0         0.000032         0.003207         0.003266	457	0	0	0.003993	0.003993
460         0         0.000006         0.00392         0.003926           461         0         0.000006         0.003883         0.00389           462         0         0.000006         0.003788         0.003794           463         0         0.000006         0.003733         0.003794           464         0         0.000006         0.003733         0.003739           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003294         0.00341           470         0         0.000025         0.003207         0.003232           471         0         0.000025         0.003116         0.003141           473         0         0.000037         0.002929         0.002966           474         0         0.000037         0.002833         0.002872	458	0	0	0.003975	0.003975
461         0         0.000006         0.003883         0.00389           462         0         0.000006         0.003838         0.003844           463         0         0.000006         0.003788         0.003794           464         0         0.000006         0.003733         0.003739           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.00313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.002929         0.002966           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002878	459	0	0.000006	0.003952	0.003958
462         0         0.000006         0.003838         0.003844           463         0         0.000006         0.003788         0.003794           464         0         0.000006         0.003733         0.003799           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.00356           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002878	460	0	0.000006	0.00392	0.003926
463         0         0.000006         0.003788         0.003794           464         0         0.000006         0.003733         0.003739           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           477         0         0.00005         0.002632         0.002688           478         0         0.00005         0.002632         0.002688	461	0	0.000006	0.003883	0.00389
464         0         0.000006         0.003733         0.003739           465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003294         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.00325         0.00356           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000075         0.002431         0.00256 </td <td>462</td> <td>0</td> <td>0.000006</td> <td>0.003838</td> <td>0.003844</td>	462	0	0.000006	0.003838	0.003844
465         0         0.000006         0.003673         0.00368           466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002632         0.002688           478         0         0.00005         0.002632         0.002688           479         0         0.000075         0.002431         0.002506           480         0         0.000075         0.002431         0.002506	463	0	0.000006	0.003788	0.003794
466         0         0.000012         0.003605         0.003617           467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002688           478         0         0.000056         0.002632         0.002688           479         0         0.000075         0.002431         0.002506           480         0         0.00017         0.00233         0.002417           481         0         0.0001         0.00223         0.002329 <td>464</td> <td>0</td> <td>0.000006</td> <td>0.003733</td> <td>0.003739</td>	464	0	0.000006	0.003733	0.003739
467         0         0.000012         0.003536         0.003549           468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.00381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000075         0.002431         0.002506           480         0         0.000075         0.002431         0.002506           481         0         0.0001         0.00223         0.002329           482         0         0.000112         0.002129         0.002241 </td <td>465</td> <td>0</td> <td>0.000006</td> <td>0.003673</td> <td>0.00368</td>	465	0	0.000006	0.003673	0.00368
468         0         0.000012         0.003459         0.003471           469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           481         0         0.0001         0.00233         0.002417           481         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216 <td>466</td> <td>0</td> <td>0.000012</td> <td colspan="2">0.000012 0.003605</td>	466	0	0.000012	0.000012 0.003605	
469         0         0.000019         0.003381         0.0034           470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.00013         0.00233         0.002417           481         0         0.00011         0.00223         0.002329           482         0         0.000112         0.002129         0.00241           483         0         0.00015         0.001933         0.002082	467	0	0.000012 0.003536		0.003549
470         0         0.000019         0.003294         0.003313           471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000056         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000187         0.00233         0.002417           481         0         0.00011         0.00223         0.002329           482         0         0.000112         0.002129         0.00241           483         0         0.00015         0.001933         0.002082           484         0         0.00015         0.001933         0.002082 <td>468</td> <td>0</td> <td>0.000012</td> <td>0.003459</td> <td>0.003471</td>	468	0	0.000012	0.003459	0.003471
471         0         0.000025         0.003207         0.003232           472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000087         0.00233         0.002417           481         0         0.00011         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000187         0.001741         0.001928 <td>469</td> <td>0</td> <td>0.000019</td> <td>0.003381</td> <td>0.0034</td>	469	0	0.000019	0.003381	0.0034
472         0         0.000025         0.003116         0.003141           473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000187         0.00233         0.002417           481         0         0.0001         0.00223         0.002329           482         0         0.000131         0.002029         0.00241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000187         0.001741         0.001928	470	0	0.000019 0.003294		0.003313
473         0         0.000031         0.003025         0.003056           474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000087         0.00233         0.002417           481         0         0.0001         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000187         0.001741         0.001928	471	0	0.000025	0.003207	0.003232
474         0         0.000037         0.002929         0.002966           475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000087         0.00233         0.002417           481         0         0.00011         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000187         0.001741         0.001928	472	0	0.000025	0.003116	0.003141
475         0         0.000044         0.002833         0.002876           476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000087         0.00233         0.002417           481         0         0.0001         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000187         0.001741         0.001928	473	0	0.000031	0.003025	0.003056
476         0         0.00005         0.002732         0.002782           477         0         0.000056         0.002632         0.002688           478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000087         0.00233         0.002417           481         0         0.0001         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000187         0.001741         0.001928	474	0	0.000037	0.002929	0.002966
477       0       0.000056       0.002632       0.002688         478       0       0.000069       0.002531       0.0026         479       0       0.000075       0.002431       0.002506         480       0       0.000087       0.00233       0.002417         481       0       0.0001       0.00223       0.002329         482       0       0.000112       0.002129       0.002241         483       0       0.000131       0.002029       0.00216         484       0       0.00015       0.001933       0.002082         485       0       0.000169       0.001832       0.002001         486       0       0.000187       0.001741       0.001928	475	0	0.000044	0.002833	0.002876
478         0         0.000069         0.002531         0.0026           479         0         0.000075         0.002431         0.002506           480         0         0.000087         0.00233         0.002417           481         0         0.0001         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000169         0.001832         0.002001           486         0         0.000187         0.001741         0.001928	476	0	0.00005	0.002732	0.002782
479       0       0.000075       0.002431       0.002506         480       0       0.000087       0.00233       0.002417         481       0       0.0001       0.00223       0.002329         482       0       0.000112       0.002129       0.002241         483       0       0.000131       0.002029       0.00216         484       0       0.00015       0.001933       0.002082         485       0       0.000169       0.001832       0.002001         486       0       0.000187       0.001741       0.001928	477	0	0.000056	0.002632	0.002688
480         0         0.000087         0.00233         0.002417           481         0         0.0001         0.00223         0.002329           482         0         0.000112         0.002129         0.002241           483         0         0.000131         0.002029         0.00216           484         0         0.00015         0.001933         0.002082           485         0         0.000169         0.001832         0.002001           486         0         0.000187         0.001741         0.001928	478	0	0.000069	0.002531	0.0026
481       0       0.0001       0.00223       0.002329         482       0       0.000112       0.002129       0.002241         483       0       0.000131       0.002029       0.00216         484       0       0.00015       0.001933       0.002082         485       0       0.000169       0.001832       0.002001         486       0       0.000187       0.001741       0.001928	479	0	0.000075	0.002431	0.002506
482     0     0.000112     0.002129     0.002241       483     0     0.000131     0.002029     0.00216       484     0     0.00015     0.001933     0.002082       485     0     0.000169     0.001832     0.002001       486     0     0.000187     0.001741     0.001928	480	0	0.000087	0.00233	0.002417
483     0     0.000131     0.002029     0.00216       484     0     0.00015     0.001933     0.002082       485     0     0.000169     0.001832     0.002001       486     0     0.000187     0.001741     0.001928	481	0			0.002329
484     0     0.00015     0.001933     0.002082       485     0     0.000169     0.001832     0.002001       486     0     0.000187     0.001741     0.001928	482	0	0.000112 0.002129		0.002241
485         0         0.000169         0.001832         0.002001           486         0         0.000187         0.001741         0.001928	483	0			0.00216
486 0 0.000187 0.001741 0.001928	484	0			0.002082
	485	0	0.000169	0.001832	0.002001
487 0 0.000212 0.001645 0.001857	486	0	0.000187	0.001741	0.001928
	487	0	0.000212	0.001645	0.001857

488         0         0.000237         0.001558         0.001795           489         0         0.000268         0.001467         0.001735           490         0         0.0003         0.001384         0.001684           491         0         0.000375         0.00122         0.001594           492         0         0.000375         0.00122         0.001594           493         0         0.000412         0.001142         0.001554           494         0         0.000462         0.001069         0.001531           495         0         0.000512         0.001001         0.001531           496         0         0.000682         0.000932         0.001494           497         0         0.000681         0.00088         0.001486           498         0         0.000681         0.00084         0.001486           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001505           501         0         0.000893         0.00064         0.001505           502         0         0.000893         0.00064         0.001557 <th></th> <th></th> <th colspan="2"></th> <th></th>					
490         0         0.0003         0.001384         0.001684           491         0         0.000337         0.001302         0.001639           492         0         0.000375         0.00122         0.001594           493         0         0.000412         0.001142         0.001554           494         0         0.000462         0.001069         0.001531           495         0         0.000512         0.001001         0.001513           496         0         0.000562         0.000932         0.001494           497         0         0.000681         0.000868         0.001486           498         0         0.000681         0.000804         0.001486           499         0         0.000749         0.000745         0.001494           500         0         0.00081         0.00069         0.001508           501         0         0.00083         0.00069         0.001508           502         0         0.000883         0.000589         0.001557           503         0         0.001055         0.000589         0.001557           503         0         0.001143         0.000498         0.001641 </td <td>488</td> <td>0</td> <td>0.000237</td> <td colspan="2">0.000237 0.001558</td>	488	0	0.000237	0.000237 0.001558	
491         0         0.000337         0.001302         0.001639           492         0         0.000375         0.00122         0.001594           493         0         0.000412         0.001142         0.001554           494         0         0.000462         0.001069         0.001531           495         0         0.000512         0.001001         0.001513           496         0         0.000662         0.000932         0.001494           497         0         0.000618         0.000868         0.001494           498         0         0.000681         0.000804         0.001494           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000883         0.00069         0.001508           501         0         0.000883         0.00069         0.001553           502         0         0.000883         0.000589         0.001557           503         0         0.001655         0.000589         0.001557           504         0         0.001143         0.000498         0.001641	489	0	0.000268	0.001467	0.001735
492         0         0.000375         0.00122         0.001594           493         0         0.000412         0.001142         0.001554           494         0         0.000462         0.001069         0.001531           495         0         0.000512         0.001001         0.001513           496         0         0.000618         0.000868         0.001494           497         0         0.000611         0.000804         0.001486           498         0         0.000681         0.000804         0.001494           500         0         0.000811         0.00069         0.001508           501         0         0.00081         0.00069         0.001508           501         0         0.000883         0.00064         0.001508           502         0         0.000883         0.00064         0.001508           503         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000589         0.001557           504         0         0.001143         0.00049         0.001641           505         0         0.001236         0.000457         0.001693 </td <td>490</td> <td>0</td> <td>0.0003</td> <td>0.001384</td> <td>0.001684</td>	490	0	0.0003	0.001384	0.001684
493         0         0.000412         0.001142         0.001554           494         0         0.000462         0.001069         0.001531           495         0         0.000512         0.001001         0.001513           496         0         0.000562         0.000932         0.001494           497         0         0.000618         0.000868         0.001486           498         0         0.000681         0.000804         0.001485           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000988         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182	491	0	0.000337	0.001302	0.001639
494         0         0.000462         0.001069         0.001531           495         0         0.000512         0.001001         0.001513           496         0         0.000562         0.000932         0.001494           497         0         0.000681         0.000808         0.001486           498         0         0.000681         0.000804         0.001486           499         0         0.000749         0.000745         0.001494           500         0         0.000881         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000589         0.001557           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000427         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.00032         0.00189           508         0         0.001542         0.00032         0.00189 </td <td>492</td> <td>0</td> <td>0.000375</td> <td>0.00122</td> <td>0.001594</td>	492	0	0.000375	0.00122	0.001594
495         0         0.000512         0.001001         0.001513           496         0         0.000562         0.000932         0.001494           497         0         0.000681         0.000868         0.001486           498         0         0.000681         0.000804         0.001485           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.00155         0.000544         0.001557           504         0         0.001433         0.000457         0.001693           505         0         0.001336         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001555         0.00032         0.001974     <	493	0	0.000412	0.001142	0.001554
496         0         0.000562         0.000932         0.001494           497         0         0.000618         0.000868         0.001486           498         0         0.000681         0.000804         0.001485           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055	494	0	0.000462	0.001069	0.001531
497         0         0.000618         0.000868         0.001486           498         0         0.000681         0.000804         0.001485           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.00042         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151     <	495	0	0.000512	0.001001	0.001513
498         0         0.000681         0.000804         0.001485           499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.00042         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000384         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001767         0.000288         0.002255           512         0         0.00213         0.000238         0.002248 </td <td>496</td> <td>0</td> <td>0.000562</td> <td>0.000932</td> <td>0.001494</td>	496	0	0.000562	0.000932	0.001494
499         0         0.000749         0.000745         0.001494           500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001894           510         0         0.001767         0.000288         0.002055           511         0         0.001866         0.000288         0.002055           511         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457 </td <td>497</td> <td>0</td> <td>0.000618</td> <td>0.000868</td> <td>0.001486</td>	497	0	0.000618	0.000868	0.001486
500         0         0.000818         0.00069         0.001508           501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457 <td>498</td> <td>0</td> <td>0.000681</td> <td>0.000804</td> <td>0.001485</td>	498	0	0.000681	0.000804	0.001485
501         0         0.000893         0.00064         0.001532           502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002652 </td <td>499</td> <td>0</td> <td>0.000749</td> <td>0.000745</td> <td>0.001494</td>	499	0	0.000749	0.000745	0.001494
502         0         0.000968         0.000589         0.001557           503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682 </td <td>500</td> <td>0</td> <td>0.000818</td> <td>0.00069</td> <td>0.001508</td>	500	0	0.000818	0.00069	0.001508
503         0         0.001055         0.000544         0.001599           504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.00253         0.000142         0.002795 <td>501</td> <td>0</td> <td>0.000893</td> <td>0.00064</td> <td>0.001532</td>	501	0	0.000893	0.00064	0.001532
504         0         0.001143         0.000498         0.001641           505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919 </td <td>502</td> <td>0</td> <td>0.000968</td> <td>0.000589</td> <td>0.001557</td>	502	0	0.000968	0.000589	0.001557
505         0         0.001236         0.000457         0.001693           506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001866         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003364 </td <td>503</td> <td>0</td> <td>0.001055</td> <td>0.000544</td> <td>0.001599</td>	503	0	0.001055	0.000544	0.001599
506         0         0.001336         0.00042         0.001756           507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003184         0.000091         0.003276 </td <td>504</td> <td>0</td> <td>0.001143</td> <td>0.000498</td> <td>0.001641</td>	504	0	0.001143	0.000498	0.001641
507         0         0.001436         0.000384         0.00182           508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.003053         0.000114         0.003366           520         0         0.003184         0.000091         0.003276           521         0         0.003315         0.000082         0.003398     <	505	0	0.001236	0.000457	0.001693
508         0         0.001542         0.000352         0.001894           509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003276           521         0         0.003184         0.000091         0.003276           522         0         0.003446         0.000073         0.00352     <	506	0	0.001336	0.00042	0.001756
509         0         0.001655         0.00032         0.001974           510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003565         0.000064         0.003629	507	0	0.001436	0.000384	0.00182
510         0         0.001767         0.000288         0.002055           511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003565         0.000064         0.003629           524         0         0.00369         0.000055         0.003745	508	0	0.001542	0.000352	0.001894
511         0         0.001886         0.000265         0.002151           512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	509	0	0.001655	0.00032	0.001974
512         0         0.00201         0.000238         0.002248           513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	510	0	0.001767	0.000288	0.002055
513         0         0.002135         0.000215         0.00235           514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	511	0	0.001886	0.000265	0.002151
514         0         0.00226         0.000196         0.002457           515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	512	0	0.00201	0.000238	0.002248
515         0         0.002391         0.000178         0.002569           516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	513	0	0.002135	0.000215	0.00235
516         0         0.002522         0.00016         0.002682           517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	514	0	0.00226	0.000196	0.002457
517         0         0.002653         0.000142         0.002795           518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	515	0	0.002391	0.000178	0.002569
518         0         0.002791         0.000128         0.002919           519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	516	0	0.002522	0.00016	0.002682
519         0         0.002922         0.000114         0.003036           520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	517	0	0.002653	0.000142	0.002795
520         0         0.003053         0.000101         0.003154           521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	518	0	0.002791	0.000128	0.002919
521         0         0.003184         0.000091         0.003276           522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	519	0	0.002922	0.000114	0.003036
522         0         0.003315         0.000082         0.003398           523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	520	0	0.003053	0.000101	0.003154
523         0         0.003446         0.000073         0.00352           524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	521	0	0.003184	0.000091	0.003276
524         0         0.003565         0.000064         0.003629           525         0         0.00369         0.000055         0.003745	522	0	0.003315	315 0.000082 0.00	
525 0 0.00369 0.000055 0.003745	523	0	0.003446		
	524	0	0.003565	0.000064	0.003629
526 0 0.003802 0.00005 0.003853	525	0	0.00369	0.000055	0.003745
	526	0	0.003802	0.00005	0.003853

527         0         0.003915         0.00046         0.00396           528         0         0.004021         0.000041         0.004062           529         0         0.004114         0.000037         0.004151           530         0         0.004289         0.000027         0.004214           531         0         0.004289         0.000023         0.004387           532         0         0.004427         0.000018         0.004455           533         0         0.004489         0.000018         0.004457           534         0         0.00453         0.000014         0.004567           535         0         0.00453         0.000014         0.004567           536         0         0.00457         0.000014         0.004567           537         0         0.004595         0.000014         0.004699           538         0         0.004614         0.000099         0.004623           539         0         0.004614         0.000099         0.004623           540         0         0.004614         0.000099         0.004623           541         0         0.004577         0.000005         0.004581					
529         0         0.004114         0.000037         0.004215           530         0         0.004208         0.000032         0.00424           531         0         0.004289         0.000027         0.004317           532         0         0.004464         0.000023         0.004387           533         0         0.004427         0.000018         0.004507           534         0         0.004533         0.000014         0.004507           535         0         0.00457         0.000014         0.004547           536         0         0.00457         0.000014         0.004609           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00462         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.00005         0.004606           542         0         0.00457         0.00005         0.004581           543         0         0.00457         0.000005         0.00454 <td>527</td> <td>0</td> <td>0.003915</td> <td>0.000046</td> <td>0.00396</td>	527	0	0.003915	0.000046	0.00396
530         0         0.004208         0.000032         0.00424           531         0         0.004289         0.000027         0.004317           532         0         0.004364         0.000023         0.004387           533         0         0.004489         0.000018         0.004507           534         0         0.004533         0.000014         0.004547           536         0         0.00457         0.000014         0.004584           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00461         0.00009         0.004623           540         0         0.00461         0.00009         0.004623           541         0         0.004614         0.00009         0.004623           541         0         0.004577         0.000005         0.004666           542         0         0.004577         0.000005         0.004581           543         0         0.004579         0.000005         0.004581           544         0         0.004495         0.000005         0.00458 <td>528</td> <td>0</td> <td>0.004021</td> <td>0.000041</td> <td>0.004062</td>	528	0	0.004021	0.000041	0.004062
531         0         0.004289         0.000027         0.04317           532         0         0.004364         0.000023         0.004387           533         0         0.004427         0.000018         0.004445           534         0         0.004533         0.000014         0.004507           535         0         0.00457         0.000014         0.004584           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00461         0.00009         0.004623           540         0         0.004614         0.00009         0.004623           541         0         0.004614         0.00009         0.004623           541         0         0.004577         0.00005         0.004666           542         0         0.004577         0.00005         0.004581           543         0         0.004539         0.00005         0.004581           544         0         0.004495         0.00005         0.0045           545         0         0.004377         0.00005         0.004381	529	0	0.004114	0.000037	0.004151
532         0         0.004364         0.000023         0.04487           533         0         0.004427         0.000018         0.004445           534         0         0.004489         0.000018         0.004507           535         0         0.004533         0.000014         0.004547           536         0         0.00457         0.000014         0.004608           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00462         0.00009         0.004623           540         0         0.004614         0.00009         0.004623           541         0         0.004614         0.00009         0.004623           541         0         0.004577         0.00005         0.004581           543         0         0.004539         0.00005         0.004584           544         0         0.004495         0.00005         0.004544           545         0         0.004439         0.00005         0.004444           546         0         0.004377         0.000005         0.004381	530	0	0.004208	0.000032	0.00424
533         0         0.004427         0.000018         0.004445           534         0         0.004489         0.000018         0.004507           535         0         0.004533         0.000014         0.004547           536         0         0.00457         0.000014         0.004584           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.00009         0.004623           539         0         0.004614         0.00009         0.004623           540         0         0.004614         0.00009         0.004623           541         0         0.004601         0.00009         0.004623           541         0         0.004577         0.00005         0.004581           542         0         0.004539         0.00005         0.004581           543         0         0.004539         0.00005         0.004544           544         0         0.004495         0.00005         0.004544           545         0         0.004439         0.00005         0.004444           546         0         0.004377         0.000005         0.004381	531	0	0.004289	0.000027	0.004317
534         0         0.004489         0.000018         0.004507           535         0         0.004533         0.000014         0.004547           536         0         0.00457         0.000014         0.004584           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00461         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.00005         0.004544           544         0         0.004495         0.00005         0.00454           545         0         0.004439         0.00005         0.004381           547         0         0.004377         0.000005         0.004381           547         0         0.004377         0.000005         0.004306           548         0         0.004221         0         0.004221	532	0	0.004364	0.000023	0.004387
535         0         0.004533         0.000014         0.004547           536         0         0.00457         0.000014         0.004584           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00462         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.004544           545         0         0.004439         0.000005         0.004444           546         0         0.004377         0.000005         0.004381           547         0         0.004302         0.00005         0.004306           548         0         0.004221         0         0.004221           549         0         0.00433         0         0.00433	533	0	0.004427	0.000018	0.004445
536         0         0.00457         0.000014         0.004584           537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00462         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.004544           544         0         0.004439         0.00005         0.004444           546         0         0.004377         0.000005         0.004381           547         0         0.004377         0.000005         0.004381           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.003333	534	0	0.004489	0.000018	0.004507
537         0         0.004595         0.000014         0.004609           538         0         0.004614         0.000009         0.004623           539         0         0.00462         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.004544           545         0         0.004439         0.000005         0.004444           546         0         0.004377         0.000005         0.004381           547         0         0.004302         0.000005         0.004381           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004221           549         0         0.004421         0         0.003333           550         0         0.00393         0         0.003827 <t< td=""><td>535</td><td>0</td><td>0.004533</td><td>0.000014</td><td>0.004547</td></t<>	535	0	0.004533	0.000014	0.004547
538         0         0.004614         0.000009         0.004623           539         0         0.00462         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.0045           545         0         0.004439         0.000005         0.004381           547         0         0.004377         0.000005         0.004386           548         0         0.004221         0         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.004404         0         0.003933           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           554	536	0	0.00457	0.000014	0.004584
539         0         0.00462         0.000009         0.004629           540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.0045           545         0         0.004439         0.000005         0.004381           547         0         0.004302         0.000005         0.004381           547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.004404         0         0.004404           551         0         0.003933         0         0.003827           553         0         0.003827         0         0.003827           554         0         0.00359         0         0.00379           555	537	0	0.004595	0.000014	0.004609
540         0         0.004614         0.000009         0.004623           541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.0045           545         0         0.004377         0.000005         0.004381           546         0         0.004377         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.00379           554         0         0.00359         0         0.003471           556         0         0.003471         0         0.003471           556         0	538	0	0.004614	0.000009	0.004623
541         0         0.004601         0.000005         0.004606           542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.0045           545         0         0.004392         0.000005         0.004381           547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.003471           556         0         0.003471         0         0.003471           556         0         0.003471         0         0.00334           557         0         <	539	0	0.00462	0.000009	0.004629
542         0         0.004577         0.000005         0.004581           543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.0045           545         0         0.004439         0.000005         0.004444           546         0         0.004377         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.003471           556         0         0.003471         0         0.003471           556         0         0.003471         0         0.003471           556         0         0.003471         0         0.00334           557         0         0.00	540	0	0.004614	0.000009	0.004623
543         0         0.004539         0.000005         0.004544           544         0         0.004495         0.000005         0.0045           545         0         0.004439         0.000005         0.004444           546         0         0.004377         0.000005         0.004306           547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.003471           556         0         0.003471         0         0.003471           556         0         0.003215         0         0.003215           558         0         0.003215         0         0.0032815           559         0.000008	541	0	0.004601	0.000005	0.004606
544         0         0.004495         0.000005         0.0044           545         0         0.004439         0.000005         0.004444           546         0         0.004377         0.000005         0.004381           547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.003215         0         0.003215           558         0         0.003245         0         0.003245           559         0.000008         0.002947         0         0.002955           560         0.000008         <	542	0	0.004577	0.000005	0.004581
545         0         0.004439         0.000005         0.004444           546         0         0.004377         0.000005         0.004381           547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003709         0         0.003709           554         0         0.00379         0         0.003709           555         0         0.003471         0         0.003471           556         0         0.003471         0         0.003471           558         0         0.003215         0         0.003215           558         0         0.003084         0         0.00384           559         0.000008         0.002947         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008	543	0	0.004539	0.000005	0.004544
546         0         0.004377         0.000005         0.004381           547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003709         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003284           559         0.000008         0.002947         0         0.002855           560         0.000008         0.002685         0         0.002692           562         0.000008         0.00	544	0	0.004495	0.000005	0.0045
547         0         0.004302         0.000005         0.004306           548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002547         0         0.002555           563         0.000008         0.00	545	0	0.004439	0.000005	0.004444
548         0         0.004221         0         0.004221           549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.003471         0         0.003471           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.	546	0	0.004377	0.000005	0.004381
549         0         0.004133         0         0.004133           550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002285         0         0.002424           564         0.000015         0.002285         0         0.0023	547	0	0.004302	0.000005	0.004306
550         0         0.00404         0         0.00404           551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	548	0	0.004221	0	0.004221
551         0         0.003933         0         0.003933           552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	549	0	0.004133	0	0.004133
552         0         0.003827         0         0.003827           553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	550	0	0.00404	0	0.00404
553         0         0.003709         0         0.003709           554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	551	0	0.003933	0	0.003933
554         0         0.00359         0         0.00359           555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	552	0	0.003827	0	0.003827
555         0         0.003471         0         0.003471           556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	553	0	0.003709	0	0.003709
556         0         0.00334         0         0.00334           557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	554	0	0.00359	0	0.00359
557         0         0.003215         0         0.003215           558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	555	0	0.003471	0	0.003471
558         0         0.003084         0         0.003084           559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	556	0	0.00334	0	0.00334
559         0.000008         0.002947         0         0.002955           560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	557	0	0.003215	0	0.003215
560         0.000008         0.002816         0         0.002823           561         0.000008         0.002685         0         0.002692           562         0.000008         0.002547         0         0.002555           563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	558	0	0.003084	0	0.003084
561     0.000008     0.002685     0     0.002692       562     0.000008     0.002547     0     0.002555       563     0.000008     0.002416     0     0.002424       564     0.000015     0.002285     0     0.0023	559	0.000008	0.002947	0	0.002955
562     0.000008     0.002547     0     0.002555       563     0.000008     0.002416     0     0.002424       564     0.000015     0.002285     0     0.0023	560	0.000008	0.002816	0	0.002823
563         0.000008         0.002416         0         0.002424           564         0.000015         0.002285         0         0.0023	561	0.000008	0.002685	0	0.002692
564 0.000015 0.002285 0 0.0023	562	0.000008	0.002547	0	0.002555
	563	0.000008	0.002416	0	0.002424
565 0.000015 0.00216 0 0.002175	564	0.000015	0.002285	0	0.0023
	565	0.000015	0.00216	0	0.002175

566	0.000015	0.002035	0	0.002051
567	0.000023	0.001911	0	0.001933
568	0.000023	0.001792	0	0.001815
569	0.00003	0.00168	0	0.00171
570	0.00003	0.001567	0	0.001597
571	0.000038	0.001455	0	0.001493
572	0.000045	0.001355	0	0.0014
573	0.000053	0.001255	0	0.001308
574	0.000061	0.001161	0	0.001222
575	0.000076	0.001074	0	0.00115
576	0.000083	0.000986	0	0.00107
577	0.000098	0.000905	0	0.001004
578	0.000114	0.00083	0	0.000944
579	0.000136	0.000762	0	0.000898
580	0.000151	0.000693	0	0.000844
581	0.000174	0.000631	0	0.000805
582	0.000197	0.000574	0	0.000771
583	0.000227	0.000518	0	0.000745
584	0.000257	0.000468	0	0.000726
585	0.000295	0.000425	0	0.00072
586	0.000333	0.000381	0	0.000714
587	0.000371	0.000343	0	0.000714
588	0.000424	24 0.000306 0		0.00073
589	0.000469	0.000275	0	0.000744
590	0.00053	0.000243	0	0.000773
591	0.00059	0.000219	0	0.000809
592	0.000659	0.000194	0	0.000852
593	0.000727	0.000169	0	0.000895
594	0.000802	0.00015	0	0.000952
595	0.000886	0.000131	0	0.001017
596	0.000976	0.000119	0	0.001095
597	0.001067	0.000106	0	0.001173
598	0.001173	0.000087	0	0.001261
599	0.001279	0.000081	0	0.00136
600	0.001393	0.000069	0	0.001461
601	0.001506	0.000062		
602	0.001627	0.00005	0	0.001677
603	0.001756	0.000044	0	0.0018
604	0.001892	0.000037	0	0.00193
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605	0.002029	0.000031	0	0.00206
606	0.002172	0.000031	0	0.002204
607	0.002316	0.000025	0	0.002341
608	0.002468	0.000019	0	0.002486
609	0.002619	0.000019	0	0.002638
610	0.00277	0.000012	0	0.002783
611	0.002922	0.000012	0	0.002934
612	0.003073	0.000012	0	0.003086
613	0.003224	0.000012	0	0.003237
614	0.003376	0.000006	0	0.003382
615	0.003527	0.000006	0	0.003533
616	0.003671	0.000006	0	0.003677
617	0.003807	0.000006	0	0.003814
618	0.003944	0.000006	0	0.00395
619	0.004065	0.000006	0	0.004071
620	0.004186	0	0	0.004186
621	0.004299	0	0	0.004299
622	0.004398	0	0	0.004398
623	0.004489	0	0	0.004489
624	0.004572	0	0	0.004572
625	0.00464	0	0	0.00464
626	0.004693	0	0	0.004693
627	627 0.004738		0	0.004738
628	0.004769	0	0	0.004769
629	0.004791	0	0	0.004791
630	0.004791	0	0	0.004791
631	0.004784	0	0	0.004784
632	0.004761	0	0	0.004761
633	0.004731	0	0	0.004731
634	0.004685	0	0	0.004685
635	0.004625	0	0	0.004625
636	0.004557	0	0	0.004557
637	0.004473	0	0	0.004473
638	0.004375	0	0 0	
639	0.004277	0		
640	0.004163	0		
641	0.004042	0	0	0.004042
642	0.003913	0	0	0.003913
643	0.003777	0	0	0.003777
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644	0.003641	0	0	0.003641
645	0.003497	0	0	0.003497
646	0.003346	0	0	0.003346
647	0.003194	0	0	0.003194
648	0.003043	0	0	0.003043
649	0.002891	0	0	0.002891
650	0.00274	0	0	0.00274
651	0.002589	0	0	0.002589
652	0.002437	0	0	0.002437
653	0.002286	0	0	0.002286
654	0.002142	0	0	0.002142
655	0.002006	0	0	0.002006
656	0.00187	0	0	0.00187
657	0.001733	0	0	0.001733
658	0.001605	0	0	0.001605
659	0.001484	0	0	0.001484
660	0.00137	0	0	0.00137
661	0.001256	0	0	0.001256
662	0.001151	0	0	0.001151
663	0.001052	0	0	0.001052
664	0.000961	0	0	0.000961
665	0.00087	0	0	0.00087
666	0.000787	0	0	0.000787
667	0.000712	0	0	0.000712
668	0.000643	0	0	0.000643
669	0.000575	0	0	0.000575
670	0.000515	0	0	0.000515
671	0.000462	0	0	0.000462
672	0.000409	0	0	0.000409
673	0.000363	0	0	0.000363
674	0.000325	0	0	0.000325
675	0.000288	0	0	0.000288
676	0.00025	0	0	0.00025
677	0.00022	0	0	0.00022
678	0.000197	0	0	0.000197
679	0.000167	0	0	0.000167
680	0.000151	0	0	0.000151
681	0.000129	0	0	0.000129
682	0.000114	0	0	0.000114
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683	0.000098	0	0	0.000098
684	0.000083	0	0	0.000083
685	0.000068	0	0	0.000068
686	0.000061	0	0	0.000061
687	0.000053	0	0	0.000053
688	0.000045	0	0	0.000045
689	0.000038	0	0	0.000038
690	0.00003	0	0	0.00003
691	0.00003	0	0	0.00003
692	0.000023	0	0	0.000023
693	0.000023	0	0	0.000023
694	0.000015	0	0	0.000015
695	0.000015	0	0	0.000015
696	0.000008	0	0	0.000008
697	0.000008	0	0	0.000008
698	0.000008	0	0	0.000008
699	0.000008	0	0	0.000008
700	0.000008	0	0	0.000008
701	0.000008	0	0	0.000008
702	0	0	0	0
703	0	0	0	0
704	0	0	0	0
705	0	0	0	0
706	0	0	0	0
707	0	0	0	0
708	0	0	0	0
709	0	0	0	0
710	0	0	0	0
711	0	0	0	0
712	0	0	0	0
713	0	0	0	0
714	0	0	0	0
715	0	0	0	0
716	0	0	0	0
717	0	0	0	0
718	0	0	0	0
719	0	0	0	0
720	0	0	0	0
721	0	0	0	0

722	0	0	0	0
723	0	0	0	0
724	0	0	0	0
725	0	0	0	0
726	0	0	0	0
727	0	0	0	0
728	0	0	0	0
729	0	0	0	0
730	0	0	0	0
731	0	0	0	0
732	0	0	0	0
733	0	0	0	0
734	0	0	0	0
735	0	0	0	0
736	0	0	0	0
737	0	0	0	0
738	0	0	0	0
739	0	0	0	0
740	0	0	0	0
741	0	0	0	0
742	0	0	0	0
743	0	0	0	0
744	0	0	0	0
745	0	0	0	0
746	0	0	0	0
747	0	0	0	0
748	0	0	0	0
749	0	0	0	0
750	0	0	0	0
751	0	0	0	0
752	0	0	0	0
753	0	0	0	0
754	0	0	0	0
755	0	0	0	0
756	0	0	0	0
757	0	0	0	0
758	0	0	0	0
759	0	0	0	0
760	0	0	0	0
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761	0	0	0	0
762	0	0	0	0
763	0	0	0	0
764	0	0	0	0
765	0	0	0	0
766	0	0	0	0
767	0	0	0	0
768	0	0	0	0
769	0	0	0	0
770	0	0	0	0
771	0	0	0	0
772	0	0	0	0
773	0	0	0	0
774	0	0	0	0
775	0	0	0	0
776	0	0	0	0
777	0	0	0	0
778	0	0	0	0
779	0	0	0	0
780	0	0	0	0

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Table D.7 – R, G and B weighting factors of the matched colours

Reference	Age		Weighting factor		Reference	Age	We	eighting fac	tor
colour	group	R	G	В	colour	group	R	G	В
	22	0.8889	0.8914	0.8956		22	0.0225	0.2478	0.3657
	27	0.8878	0.8922	0.8938		27	0.0238	0.2469	0.3661
	32	0.8867	0.8929	0.8921		32	0.0250	0.2461	0.3666
	37	0.8857	0.8937	0.8906		37	0.0262	0.2452	0.3672
	42	0.8847	0.8945	0.8891		42	0.0274	0.2443	0.3678
Macbeth White	47	0.8837	0.8953	0.8878	Macbeth	47	0.0285	0.2434	0.3684
	52	0.8827	0.8961	0.8867	Cyan	52	0.0296	0.2426	0.3691
	57	0.8817	0.8969	0.8856		57	0.0307	0.2417	0.3699
	62	0.8798	0.8985	0.8838		62	0.0327	0.2400	0.3714
	67	0.8766	0.9012	0.8816		67	0.0359	0.2373	0.3744
	72	0.8733	0.9041	0.8805		72	0.0389	0.2346	0.3778
	77	0.8699	0.9072	0.8802		77	0.0415	0.2320	0.3815
	22	0.3636	0.0428	0.0497		22	0.4293	0.1037	0.3031
	27	0.3636	0.0428	0.0495		27	0.4288	0.1041	0.3012
Macbeth Red	32	0.3637	0.0428	0.0493	Macbeth	32	0.4285	0.1045	0.2994
	37	0.3638	0.0428	0.0492	Magenta	37	0.4281	0.1049	0.2977
	42	0.3639	0.0428	0.0490		42	0.4278	0.1052	0.2960
	47	0.3640	0.0428	0.0489		47	0.4275	0.1055	0.2944

0.0364

0.0365

0.0366

72

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0.0508

0.0507

0.0506

0.2865

0.2866

0.2868

	52	0.3640	0.0428	0.0488		52	0.4272	0.1058	0.2929
	57	0.3641	0.0428	0.0486		57	0.4269	0.1061	0.2914
	62	0.3643	0.0427	0.0484		62	0.4265	0.1066	0.2888
	67	0.3646	0.0427	0.0481		67	0.4260	0.1074	0.2846
	72	0.3650	0.0426	0.0479		72	0.4256	0.1080	0.2810
	77	0.3653	0.0425	0.0478		77	0.4253	0.1086	0.2779
	22	0.1037	0.2953	0.0783		22	0.7894	0.5808	0.0669
	27	0.1037	0.2953	0.0784		27	0.7879	0.5819	0.0669
Macbeth Green	32	0.1037	0.2953	0.0785		32	0.7864	0.5830	0.0670
	37	0.1037	0.2953	0.0786		37	0.7849	0.5841	0.0670
	42	0.1037	0.2953	0.0787		42	0.7834	0.5852	0.0671
	47	0.1036	0.2953	0.0788	Macbeth	47	0.7819	0.5864	0.0672
	52	0.1036	0.2954	0.0789	Yellow	52	0.7804	0.5875	0.0673
	57	0.1035	0.2954	0.0791		57	0.7788	0.5887	0.0674
	62	0.1034	0.2955	0.0794		62	0.7760	0.5910	0.0676
	67	0.1032	0.2956	0.0800		67	0.7710	0.5951	0.0680
	72	0.1030	0.2958	0.0807		72	0.7661	0.5994	0.0684
	77	0.1026	0.2961	0.0815		77	0.7612	0.6039	0.0689
	22	0.0360	0.0511	0.2880					
	27	0.0360	0.0511	0.2878					
	32	0.0360	0.0511	0.2875					
	37	0.0360	0.0511	0.2874					
	42	0.0361	0.0511	0.2872					
Macbeth Blue	47	0.0361	0.0511	0.2870					
	52	0.0361	0.0510	0.2869					
	57	0.0362	0.0510	0.2868					
	62	0.0363	0.0510	0.2866					
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