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Colorimetry —

Part 5: CIE 1976 L*u*v* colour space and u', v' uniform chromaticity scale diagram

Colorimétrie —

*Partie 5: Espace chromatique L*u*v* et diagramme de chromaticité uniforme u', v' CIE 1976*

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Foreword

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The committee responsible for this document is ISO/TC 274, *Light and lighting*.

This first edition of ISO/CIE 11664-5 cancels and replaces ISO 11664-5:2009, of which it constitutes a minor revision. (ISO 11664-5:2009 was prepared by CIE Technical Committee TC 1-57 of Division 1.)

ISO 11664 consists of the following parts, under the general title *Colorimetry*:

— *Part 1: CIE standard colorimetric observers*

— *Part 2: CIE standard illuminants*

— *Part 3: CIE tristimulus values*

— *Part 4: CIE 1976 L*a*b* Colour space*

ISO/CIE 11664 consists of the following parts, under the general title *Colorimetry*:

— *Part 5: CIE 1976 L*u*v* colour space and u′, v′ uniform chromaticity scale diagram*

— *Part 6: CIEDE2000 Colour-difference formula*

Introduction

The three-dimensional colour space produced by plotting CIE tristimulus values (*X*, *Y*, *Z*) in rectangular coordinates is not visually uniform nor is the (x,y,Y) space nor the two-dimensional CIE x,y chromaticity diagram. Equal distances in these spaces and diagrams do not represent equally perceptible differences between colour stimuli. For this reason, in 1976, the CIE introduced and recommended two new spaces (known as CIELAB and CIELUV) whose coordinates are non-linear functions of *X*, *Y* and *Z*. The recommendation was put forward in an attempt to unify the then very diverse practice in uniform colour spaces and associated colour difference formulae.[2][8] Both these more-nearly uniform colour spaces have become well accepted and widely used. Numerical values representing approximately the relative magnitude of colour differences can be described by simple Euclidean distances in the spaces or by more sophisticated formulae that improve the correlation with the relative perceived size of differences. The purpose of this part of ISO/CIE 11664 is to define procedures for calculating the coordinates of the CIE 1976 L*u*v* (CIELUV) colour space and the Euclidean colour difference values based on these coordinates. This part of ISO/CIE 11664 also defines a related chromaticity diagram that is a projection of the CIE x,y chromaticity diagram maintaining straight lines of dominant and complementary wavelengths. This part of ISO/CIE 11664 does not cover the alternative uniform colour space, CIELAB,[5] nor does it cover more sophisticated colour difference formulae based on CIELAB, such as the CMC formula,[3] the CIE 94 formula,[1] the DIN 99 formula,[4] and the CIEDE2000 formula.[6]