IEC 62522

Edition 2.0 2024-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Calibration of tuneable laser sources

Étalonnage des sources laser accordables

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 31.260, 33.180.01

ISBN 978-2-8322-9034-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CALIBRATION OF TUNEABLE LASER SOURCES

FOREWORD

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IEC 62522 has been prepared by IEC technical committee 86: Fibre optics. It is an International Standard.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition of references to IEC 61315;
b) addition of Table 1 and Table 2 on uncertainties;
c) clarification of the reference power meter settings in 6.2.3 and 6.3.2.3.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86/639/FDIS	86/643/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

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 www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

Wavelength-division multiplexing (WDM) transmission systems have been deployed in optical trunk lines. ITU-T Recommendations in the G.694 series describe the frequency and wavelength grids for WDM applications. For example, the frequency grid of ITU-T Recommendation G.694.1 supports a variety of channel spacing ranging from 12,5 GHz to 100 GHz and wider. WDM devices, such as arrayed waveguide grating (AWG), thin film filter or grating based multiplexers (MUX), and demultiplexers (DMUX) with narrow channel spacing are incorporated in the WDM transmission systems. When measuring the characteristics of such devices, wavelength tuneable laser sources are commonly used and are required to have well-calibrated performances; wavelength uncertainty, wavelength tuning repeatability, wavelength stability, and output optical power stability are important parameters.

The tuneable laser source (TLS) is generally equipped with the following features:

a) the output wavelength is continuously tuneable in a wavelength range starting at 1 530 nm or higher and ending at less than 1 675 nm (the output should excite only the fundamental LP01 fibre mode);

b) an output port for optical fibre connectors.

The envelope of the spectrum is a single longitudinal mode with a full width at half-maximum (FWHM) of at most 0,1 nm. Any adjacent modes are at least 20 dB lower than the main spectral mode (for example, a distributed feedback laser diode (DFB-LD), external cavity laser, etc.).

CALIBRATION OF TUNEABLE LASER SOURCES

1 Scope

This document provides a stable and reproducible procedure to calibrate the wavelength and power output of a tuneable laser against reference instrumentation such as optical power meters and optical wavelength meters (including optical frequency meters) that have been previously traceably calibrated.

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.

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCSs)*

IEC 61315, *Calibration of fibre-optic power meters*

IEC 62129-2, *Calibration of wavelength/optical frequency measurement instruments – Part 2: Michelson interferometer single wavelength meters*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
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