
Preskusne metode optičnega ojačevalca – 11-1. del: Disperzija načina polarizacije - Metoda Jones-lastne vrednosti matrike (JME) (IEC 61290-11-1:2003)*

Optical amplifier test methods - Part 11-1: Polarization mode dispersion - Jones matrix eigenanalysis method (JME) (IEC 61290-11-1:2003)

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ICS 33.180.30

Referenčna številka
SIST EN 61290-11-1:2004(en)

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SIST EN 61290-11-1:2004

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English version

Optical amplifier test methods
Part 11-1: Polarization mode dispersion -
Jones matrix eigenanalysis method (JME)
(IEC 61290-11-1:2003)

Méthodes d'essai des amplificateurs
à fibres optiques
Partie 11-1: Dispersion en mode
de polarisation -
Méthode d'analyse propre
de matrice de Jones (JME)
(CEI 61290-11-1:2003)

Prüfverfahren für Lichtwellenleiter-
Verstärker
Teil 11-1: Polarisationsmodendispersion -
Jones-Matrix-Eigenanalyse (JME)
(IEC 61290-11-1:2003)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 86C/495/FDIS, future edition 1 of IEC 61290-11-1, prepared by SC 86C, Fibre optic systems and active devices, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61290-11-1 on 2003-04-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-04-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A and B are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61290-11-1:2003 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60793-1-1	NOTE	Harmonized as EN 60793-1-1:2003 (not modified).
IEC 60825-1	NOTE	Harmonized as EN 60825-1:1994 (not modified).
IEC 60825-2	NOTE	Harmonized as EN 60825-2:2000 (not modified).
IEC 60874-1	NOTE	Harmonized as EN 60874-1:1999 (not modified).
IEC 61291-1	NOTE	Harmonized as EN 61291-1:1998 (not modified).

NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

61290-11-1

Première édition
First edition
2003-02

**Méthodes d'essai des amplificateurs
à fibres optiques –**

**Partie 11-1:
Dispersion en mode de polarisation –
Méthode d'analyse propre de matrice
de Jones (JME)**

Optical amplifier test methods –

**Part 11-1:
Polarization mode dispersion –
Jones matrix eigenanalysis method (JME)**

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Международная Электротехническая Комиссия

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CONTENTS

FOREWORD	5
INTRODUCTION	7
1 Scope and object	9
2 Apparatus	11
2.1 Tunable laser	11
2.2 Polarization adjuster	11
2.3 Polarizers	11
2.4 Input optics	13
2.5 Fibre pigtail	13
2.6 Optical lens system	13
2.7 Output optics	13
2.8 Polarimeter	13
3 Procedure	13
4 Calculations	15
4.1 Jones matrix eigenanalysis calculations	15
4.2 Display of DGD versus wavelength	15
4.3 Average DGD	17
4.4 Maximum DGD	17
5 Test results	17
Annex A (informative) List of symbols and abbreviations	19
Annex B (informative) Degree of polarization reduction due to optical amplifier ASE	21
Bibliography	25
Figure 1 – Schematic diagram of equipment (typical)	11
Figure 2 – Measurement example of the DGD for a typical optical amplifier (the DOP for this measurement ranged from 57 % to 79 %)	17
Figure B.1 – Spectrum of optical amplifier output (OSA resolution bandwidth is 0,5 nm)	21

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL AMPLIFIER TEST METHODS –

Part 11-1: Polarization mode dispersion –
Jones matrix eigenanalysis method (JME)

FOREWORD

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International Standard IEC 61290-11-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86C/495/FDIS	86C/516/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

As far as can be determined, this part of IEC 61290 is the first International Standard on this subject. The technology of optical fibre amplifiers is still evolving, hence amendments and new editions to this document should be expected.

Each abbreviation introduced in this standard is explained in the text at least the first time it appears. However, for an easier understanding of the whole text, a list of all abbreviations used is given in Annex A.

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OPTICAL AMPLIFIER TEST METHODS –

Part 11-1: Polarization mode dispersion – Jones matrix eigenanalysis method (JME)

1 Scope and object

This part of IEC 61290 applies to all commercially available optical amplifiers (OAs) including optical fibre amplifiers (OFAs) using active fibres and semiconductor optical amplifiers (SOAs) using semiconductor gain media.

Polarization-mode dispersion (PMD) causes an optical pulse to spread in the time domain. This dispersion could impair the performance of a telecommunications system. The effect can be related to differential group velocity and corresponding arrival times of different polarization components of the signal. For a narrowband source, the effect can be related to a differential group delay (DGD) between pairs of orthogonally polarized principal states of polarization (PSP).

This test method describes a procedure for measuring the PMD of OAs. The measurement result is obtained from the measurement of the normalized Stokes parameters at two closely spaced wavelengths.

The test method described herein requires a polarized signal at the input of the polarimeter with a degree of polarization (DOP) of at least 25 %. Although the test source is highly polarized, the DOP at the output of the OA is reduced by amplified spontaneous emission (ASE). Annex B analyses the impact of ASE on the DOP. In order to assure an accurate measurement, the DOP is measured as part of the measurement procedure.

The method described herein has been shown to be immune to polarization-dependent gain (PDG) and polarization dependent loss (PDL) up to approximately 1 dB.

Although the Jones matrix eigenanalysis (JME) test method is in principle also applicable to unpumped (that is, unpowered) OAs, the JME technique in this standard applies to pumped (that is, powered) OAs only.

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