

New robust and reliable chromatic dispersion measurement system

New chromatic dispersion measurement techniques have been developed to improve some weakness of current commercial analyzers. The technology based on detection of amplitude nulls allows a significant reduction of the cost and complexity. Partners to further develop the system and/or to establish commercial agreements with technical cooperation are sought.

The Challenge

Chromatic dispersion is the most important limiting factor of the bit-rate length product in optical fiber links. Its accurate, fast and simple characterization in a laboratory environment as well as its real-time monitorization in operative optical networks is a critical issue. The traditional standard methods implemented in commercial Chromatic Dispersion meters, such as the Modulation Phase Shift Method (MPSM), require to be ameliorate and tailored to the present industry needs with advances in terms of cost, reliability, accuracy and simplicity.

The Technology

This new patented technology is based on detection of amplitude nulls due to destructive interference between two optical sidebands generated by modulation of an optical carrier of interest, which mix in an optical photodiode. The phase shift among the sidebands depends on the frequency of modulation, on the value of dispersion to measure and, if an external modulator driven asymmetrically is used, also in the modulator bias point. It is then possible to determine the value of dispersion at any fixed modulation frequency by changing the bias value until destructive interference occurs.

Innovative advantages

- Important reduction of the cost and complexity of standard chromatic dispersion meters based in standard MPSM while preserving accuracy, because it is based on detection of electrical amplitudes rather than phases.
- High robustness against amplitude variations in the spectral response of the Device Under Test and/or the measurement system.
- Extensions of the technique allow optical scans to be performed by sweeping an electrical modulation frequency thus removing the need, or at least relaxing, the requirements over tunable lasers.
- The technique also may be adapted for the real time monitoring of chromatic dispersion in operative optical networks.

Current stage of development

Feasibility of the new technique for accurate chromatic dispersion measurement, optical scan by electrical modulation frequency sweep and optical network monitoring has been confirmed in laboratory tests. Foreseeable extensions of the technique for complete optical vectorial network analysis are still an open research issue.

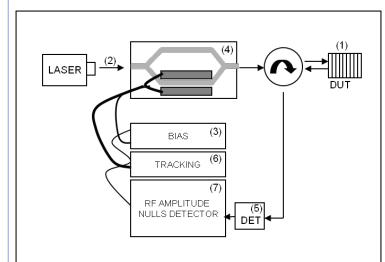
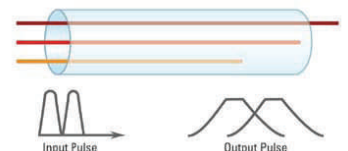
Applications and Target Market

Measurement and monitoring tools manufacturers. Optical network installation and monitoring companies. Optical network operators.

Reference number

MKT2010/0012_I

Improved techniques for chromatic dispersion analyzers



Real time monitoring of chromatic dispersion

A better way to test for chromatic dispersion

Optical scan by electrical modulation frequency sweep

Business Opportunity

Technology available for licensing with technical cooperation

Patent Status

Spanish patent application

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