

Large Axial Range Frequency-Domain Optical Low Coherence Interferometry

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Resumen

In this letter, we propose a new experimental setup to extend the measurement range of frequency-domain low coherence interferometry (FD-LCI) from 3 mm to 2 cm. The FD-LCI can be extended to the technique of frequency domain optical coherence tomography by performing additional lateral scanning. This new and simple arrangement just attaches an extra interferometer before the spectrometer in a typical FD-LCI setup. With this configuration, it is possible to overcome the limitation of the dynamic range of the conventional technique. This allows us to measure the optical path difference of the sample of interest, which is outside the detection range of the spectrometer, using an extra interferometer as a tuner system. In addition, this tuning allows significant minimization of the effects produced by the fall-off. The accuracy of the new system is obtained by adding the FD-LCI and the tuning micrometric translator accuracies. In our experimental setup, this value is 20 μm .

Palabras Claves: UTN; FRD; Optical interferometry, Optical variables measurement, Dynamic range, Coherence, Tuning, Light sources, Optical fibers