Spectral sensor resolution measurement improvements by temporal analysis

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Abstract:
In this work we present time domain interferometry (TDI) and spectral domain interferometry (SDI) techniques applied to a fiber optic Fizeau interferometer sensor. This class of sensor is capable of measuring parameters such as position, length and vibrations, in the spectral domain with improved resolution by a temporal analysis. In particular, Fourier domain SDI (FD-SDI), is able of measuring absolute cavity lengths with a resolution of 10 μm typically, depending on the bandwidth of the optic source and the spectrometer. Alternatively, TDI allows making displacement measurements within a resolution of λ/10, depending on the laser light wavelength (λ) used.
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