

Interferometric Demodulation Scheme Using a Mode-Locker Fiber Laser

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Abstract : We demonstrated an interferometric demodulation scheme using a mode-locked fiber laser. The mode-locked fiber laser is launched into a two-beam interferometer. When the ratio between the fiber path imbalance of interferometer and the laser cavity length is close to an integer, an interferometric fringe emerges as a result of vernier effect, and then the phase shift of the interferometer can be demodulated. The mode-locked fiber laser provides a large bandwidth and reduces the cost for wavelength division multiplexion (WDM). The proposed interferometric demodulation scheme can be further applied in multi-point sensing system such as fiber optics hydrophone array, seismic wave detection network with high sensitivity and low cost.

Keywords : fiber sensing, interferometric demodulation, mode-locked fiber laser, vernier effect

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020