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(57) Abstract :

ABSTRACT TITLE: PORTABLE INTERFEROMETRY SYSTEM FOR REAL-TIME SURFACE PROFILING AND DISPLACEMENT MEASUREMENT WITH A LARGE DYNAMIC RANGE. The present invention relates to a fiber interferometry based profilometer system for real-time surface profiling and displacement measurement with dynamic range using a combination of optical fiber based interferometers. The set-up combines two interferometers in series to form a system that shows an optical vernier effect with magnified and tunable sensitivity. Each interferometer is formed between a reflective surface and the sharply cleaved end of the single-mode fiber that reflects light due to Fresnel reflection. This system offers surface profiling from nanometer scale to millimeter (10 nm to 1 mm) scale using a single setup with two modes of operations. The proposed system also offers real-time displacement sensing from nanometer to millimeter scale. This scheme provides reconfigurability, sensitivity tunability, compactness, cost-effectiveness, and a broad operational range. This system provides easy operation and an easily mountable facility. This system will thus play a significant role in many industrial and research applications for testing roughness, texture, and many other surface properties. (Figure 2)

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