Contribution ID: **301** Type: **Poster**

Construction of 3D Image of Surface Coated with Micro-Scale Transparent Layer by Analyzing Speckle Interferogram with Fast Fourier Transform

Wednesday 24 May 2017 15:45 (15 minutes)

Light interferometry is one of great non-destructive tools for making a surface profile image of materials. Because of phase difference analyzing method as a Fast Fourier transform (FFT), 3D surface profile image can be constructed from a speckle interferogram of He-Ne laser.[ref] However, 3D image of a surface coated with micro-scale transparent layer cannot be structure by using He-Ne laser as a light source of Michelson Interferometer (MI). In this research, 3D image of groove surface of standard gauge block, coated with transparent layer, is constructed by using FFT for analyzing the speckle image taking form MI with a low coherence light source as Superluminesent diode (SLD). The constructed surface image of the coated surface well agrees with the one of uncoated surface built from the same method. It also agrees with the one of uncoated surface analyzing the interferogram of He-Ne laser as a light source of MI by using FFT, as well.

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Session Classification: Poster Presentation I

Track Classification: Optics, Non-linear optics, Laser Physics, Ultrafast Phenomena