

Direct analysis of in-line particle holograms by using wavelet transform and envelope reconstruction method

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Abstract: We propose a new digital method for sizing particles and tracking their positions from an in-line hologram by using a combination of a wavelet transform and a reconstruction of the envelope functions. In the proposed method, the hologram is recorded by a charge-coupled device (CCD) sensor. The wavelet transform of digitized holograms gives information about the position of particles, while the reconstruction of envelope functions provides the size of particle. Preliminary theoretical and experimental verifications are presented. The system limitation of the method is discussed.

Ei controlled terms: Holography - Holograms - Wavelet transforms - Charge coupled devices - Optical sensors - Optical collimators - Coherent light - Light interference