

Abstract Submitted
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Single Shot Diffraction Limited Fourier Holography Scheme using a Table top Soft X-ray Laser ERIK MALM, NILS MONSERUD, CHRIS BROWN, Colorado State University, PRZEMYSŁAW WACHULAK, Military University of Technology, Warsaw, Poland, GANESH BALAKRISHNAN, University of New Mexico, MARIO MARCONI, Colorado State University — Single-shot Fourier transform holography has been demonstrated utilizing a 46.9 nm table-top plasma discharge laser. A zone plate illuminated by the laser light is used to form both the reference wave and the object waves. The object waves are formed from plane waves scattering off a non-transparent object. The interference pattern between the spherical reference wave and the object waves is recorded on a charge-coupled device. The resolution limit of 150 nm is determined by the focal spot size of the zone plate. A knife-edge scan of the resulting hologram obtains a single-shot spatial resolution of 163 nm. This setup has been designed for analyzing nano-pillar dynamics for the purpose of single-molecule mass detection. The nonlinear coupling between pillars allows for a higher sensitivity than single pillar detection schemes.

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