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Holographic imaging of nano-scale objects using soft x-ray laser light at 13.9nm and 18.9nm. ALEX ROCKWOOD, YONG WANG, SHOUJUN WANG, CHAN KYAW, CARMEN MENONI, MARIO MARCONI, JORGE ROCCA, Colorado State University, COLORADO STATE UNIVERSITY TEAM — The short wavelength of soft x-ray light enables extending holographic techniques to the nano-scale. Holographic imaging requires coherent beams. We describe the generation of highly coherent x-ray beam using an x-ray laser with a separate seed and amplifier stage. The 13.9nm or 18.9nm coherent x-ray beams produced by this laser were used to image nanowires using Fourier holography. Part of the soft x-ray laser beam was focused with a Fresnel zone plate into a 1-2 um hole to generated spherical reference wave. The open middle zone of the zone plate lets light pass through to illuminate the object. The interferogram resulting from the interference of the two beams is then inverse Fourier transformed to produce an image of the objective. Holograms of 50-70 nm diameter nanowires were obtained.

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