Abstract Submitted
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Superresolution measurement of nanofiber diameter by modes beating[1] E. F. FENTON, P. SOLANO, J. E. HOFFMAN, L. A. OROZCO, S. L. ROLSTON, JQI, Univ of Maryland-College Park, F. K. FATEMI, Army Research Laboratory, Adelphi, MD 20783, USA — Nanofibers are becoming an important tool in quantum information technologies for coupling photonics systems to atomic systems. Nondestructive techniques for characterizing these nanofibers prior to integration into an apparatus are desirable. In this work, we probe the light propagating in a fused silica optical nanofiber (750-nm-diameter) by coupling it evanescently to a 6-μm-diameter microfiber that is scanned along the nanofiber length. This technique is capable of observing all possible beat lengths among different propagating modes. The beat lengths are strongly dependent on the nanofiber diameter and refractive index of the fiber. The steep dependence has enabled measurements of the fiber diameter with sub-Angstrom sensitivity. The diameter extracted from the beat length measurements agrees with a measurement made using scanning electron microscopy.

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Pablo Solano
Univ of Maryland-College Park

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