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High precision interferometry with a transition edge sensor CHRISTOPH F. WILDFEUER<sup>1</sup>, Louisiana State University, AARON J. PEARL-MAN, JUN CHEN, Joint Quantum Institute, National Institute of Standards and Technology, and University of Maryland, JONATHAN P. DOWLING, Hearne Institute for Theoretical Physics, Louisiana State University, Baton Rouge, JINGYUN FAN, ALAN MIGDALL, Joint Quantum Institute, National Institute of Standards and Technology, and University of Maryland, HEARNE INSTITUTE FOR THE-ORETICAL PHYSICS, LOUISIANA STATE UNIVERSITY, BATON ROUGE TEAM, JOINT QUANTUM INSTITUTE, NATIONAL INSTITUTE OF STAN-DARDS AND TECHNOLOGY, AND UNIVERSITY OF MARYLAND TEAM — In this contribution, we present our studies of Michelson and Fabry-Perot interferometers with a photon-number resolving detector. We show experimentally that with a weak coherent light beam, the use of a photon-number resolving detector improves the interferometric resolution. We also discuss ways the sensitivity of interferometers can be further improved beyond the standard quantum limit by using nonclassical light and photon-number resolving detectors.

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