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Heisenberg-limited optical interferometry with parity detection KAUSHIK SESHADREESAN, PETR ANISIMOV, HWANG LEE, JONATHAN DOWLING, LSU — We present our theoretical study of the sensitivity and resolution of phase measurement, in a Mach-Zehnder interferometer with coherent light and squeezed vacuum inputs, using parity detection. Mixing coherent light and squeezed vacuum has been previously shown to produce N00N-like states inside the interferometer, which suggests a near Heisenberg-limited phase sensitivity. Our results comply with the above observation at high photon numbers. Given a recently shown implementation of parity detection using homodyne detection, we propose an experiment for phase super-sensitivity with high photon flux.

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