

Abstract Submitted
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Coherent-Light Boosted, Super-Sensitive, Quantum Interferometry WILLIAM PLICK, JONATHAN DOWLING, Louisiana State University, GIRISH AGARWAL, Oklahoma State University — We present a new scheme for optical interferometry. We utilize coherent-beam stimulated two-mode squeezed light, which interacts with a phase and is then squeezed again before detection. Our protocol has the potential to reach far below the shot noise limit (SNL) in phase sensitivity. This new proposal avoids the pitfalls of other setups, such as difficulty in creating the required resource. Furthermore, our scheme requires no complicated detection protocol, relying instead only on simple intensity measurement. Also, bright, coherent sources “boost” squeezed light, creating a very sensitive device. In the following we present our analysis of this relatively straightforward device, using the operator propagation method. We derive the phase sensitivity and provide a simple numerical example of the power of our new proposal. Sensitivity scales as a shot noise limited Mach-Zehnder Interferometer, multiplied by a sub-Heisenberg contribution from the squeezed light.

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