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Low Noise Laser System for Atom Interferometer Applications AZURE HANSEN, National Institute of Standards and Technology, YUN-JHIH CHEN, GREGORY W. HOTH, National Institute of Standards and Technology and University of Colorado Boulder, EUGENE IVANOV, National Institute of Standards and Technology and University of Western Australia, JOHN KITCHING, ELIZABETH A. DONLEY, National Institute of Standards and Technology — We present a low noise, robust, and flexible laser system that simplifies atom interferometer experiments for applications in remote sensing and navigation. We use one external-cavity diode laser (ECDL) and one frequency-doubled telecom laser, both with linewidths $< 100 \, \text{kHz}$. The telecom laser is locked to the ECDL with an optical phase lock loop (OPLL), which electronically shifts the telecom lasers frequency for different stages of the experiment. The OPLL moves the laser frequency by hundreds of MHz and the frequency stabilizes within a few hundred μ s. While we demonstrate this laser system on a compact point source atom interferometer gyroscope, the technique is of interest for other experiments requiring many different nonconcurrent frequencies.

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