

Abstract Submitted
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Record long term stability of an optical local oscillator WILLIAM MILNER, ERIC OELKER, JOHN ROBINSON, COLIN KENNEDY, TOBIAS BOTHWELL, DHARUV KEDAR, JUN YE, JILA, University of Colorado - Boulder — The long term stability of optical local oscillators is of wide scientific interest, from studies of dark matter to applications in time scales. We report on an optical local oscillator based on a cryogenic silicon cavity with improved frequency noise compared with state-of-the-art microwave oscillators at all averaging times up to 5 days. To evaluate the long term stability of our 124 K silicon cavity, a data campaign of over one month was undertaken, which involved daily measurements (of several hours) of the silicon cavity frequency against a 1D strontium lattice clock with systematic uncertainty at the low 10^{-18} level. We will present the measurement results and analysis.

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