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**Stability improvements for the NIST Yb optical lattice clock** R.J. FASANO[1], M. SCHIOPPO, W.F. MCGREW[2], R.C. BROWN, N. HINKLEY[3], T.H. YOON[4], K. BELOY, C.W. OATES, A.D. LUDLOW, National Institute of Standards and Technology — To reach the fundamental limit given by quantum projection noise, optical lattice clocks require advanced laser stabilization techniques. The NIST ytterbium clock has benefited from several generations of extremely high finesse optical cavities, with cavity linewidths below 1 kHz. Characterization of the cavity drift rate has allowed compensation to the mHz/s level, improving the medium-term stability of the cavity. Based on recent measurements using Ramsey spectroscopy with synchronous interrogation, we report a fractional instability $\sigma_y(1\text{ s}) \leq 10^{-16}$, dominated by atom number fluctuation noise. We also provide updates on our cryogenic sapphire cavity with a reduced thermal noise floor, which will improve our Dick-limited fractional instability at 1 s to below $10^{-16}$.

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