

Abstract Submitted
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Systematic evaluation of a strontium optical lattice clock at 1×10^{-16} GRETCHEN K. CAMPBELL, ANDREW D. LUDLOW, SEBASTIAN BLATT, TANYA ZELEVINSKY, MARTIN M. BOYD, MICHAEL J. MARTIN, JAN W. THOMSEN, JUN YE, JILA, NIST and the University of Colorado Department of Physics, TARA M. FORTIER, JASON E. STALNAKER, SCOTT A. DIDDAMS, CHRIS W. OATES, National Institute of Standards and Technology — We have recently completed an evaluation of the uncertainty of a ^{87}Sr optical lattice clock at the 1×10^{-16} fractional level, surpassing the best current evaluations of Cs primary standards. The evaluation was performed using a remote comparison of optical clocks over km-scale urban distances. This allowed us to evaluate the Sr clock located at JILA, against the Ca optical clock operated $\sim 4\text{km}$ away at NIST via an optical fiber link. We will report on the observation of density-dependent effects in the doubly spin-polarized (fermionic) sample. Using a single spin state, and by varying the excitation fraction, we have found experimental parameters for which the density shift of the clock transition is consistent with zero.

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