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^{87}Sr Clock Comparisons at JILA JASON WILLIAMS, TRAVIS NICHOLSON, BENJAMIN BLOOM, SARA CAMPBELL, MICHAEL MARTIN, MATTHEW SWALLOWS, MICHAEL BISHOF, JUN YE, JILA, NIST, and the University of Colorado — Great advances are being realized with optical lattice clocks, where spectroscopy at optical frequencies and large ensembles of neutral atoms combine to offer extremely high frequency precision and stability. Recent results from the Strontium 87 optical atomic clock at JILA have demonstrated that strong interactions among fermions confined in a two-dimensional (2D) optical lattice suppress the collisional frequency shift and its uncertainty to the level of 10^{-17} [1]. We report on the progress of a second optical lattice clock at JILA, in which fermionic ^{87}Sr atoms are confined in a lattice potential derived from optical buildup cavities to provide strong confinement over a very large volume in one, two, and three dimensional lattices. Intercomparisons of the two clocks at JILA will be used to explore in greater detail the physics governing the transition shifts and uncertainties in our two ^{87}Sr optical lattice systems and will provide a significant improvement of our systematic errors.

[1] M D. Swallows *et al.* Science, **331**, 1043 (2011)

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