ID de Contribution: **15** Type: **Invited talk**

Improved Sr clock total uncertainty and development of a degenerate, 3D lattice clock

mardi 23 février 2016 15:00 (30 minutes)

Abstract: We report on improvements to the accuracy and stability of the JILA Sr clock, reaching a total fractional clock uncertainty of 2e-18, primarily by reducing the uncertainties due to the optical lattice and blackbody radiation. The blackbody radiation shift was determined through accurate thermometry, with in vacuum thermometers traceable to the NIST ITS-90 temperature scale, and an improved determination of the atomic structure. We will also discuss progress of a new apparatus that traps quantum degenerate strontium in a three-dimensional magic-wavelength optical lattice. We have reached quantum degeneracy with ten spin states and will load the degenerate atoms into the lowest band of a 3D lattice. The apparatus will be used to explore spin-orbit coupling, quantum magnetism, and improve the performance of future lattice clocks.

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