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Resolved atomic interaction sidebands in an optical clock transition ANA MARIA REY, MICHAEL BISHOF, YIGE LIN, MATTHEW SWALLOWS, MICHAEL MARTIN, JILA, NIST, University of Colorado, ALEXEY GORSHKOV, IQI, Caltech, JUN YE, JILA, NIST, University of Colorado — We report the observation of resolved atomic interaction sidebands (ISB) in the ^{87}Sr optical clock transition when atoms at microkelvin temperatures are confined in a two-dimensional (2D) optical lattice. The ISB are a manifestation of the strong interactions that occur between atoms confined in a quasi-one-dimensional geometry and disappear when the confinement is relaxed along one dimension. The emergence of ISB is linked to the recently observed suppression of collisional frequency shifts [1]. At the current temperatures, the ISB can be resolved but are broad. At lower temperatures, ISB are predicted to be substantially narrower and usable as powerful spectroscopic tools in strongly interacting alkaline earth gases.

[1] M. D. Swallows *et al.* Science (10.1126/science.1196442.)

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