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Collisional Frequency Shifts in a Fermionic Yb Lattice Clock NATHAN LEMKE, NIST and University of Colorado-Boulder, ANDREW LUD-LOW, JEFF SHERMAN, CHRIS OATES, NIST, JAVIER VON STECHER, ANA MARIA REY, JILA, University of Colorado-Boulder and NIST — In optical lattice clocks based on fermionic isotopes of Sr and Yb, density-dependent frequency shifts are among the leading contributors to the total clock uncertainty. These shifts are caused by s-wave collisions which arise from optical excitation inhomogeneity, allowing otherwise identical fermions to collide. Here we study the collisions in ¹⁷¹Yb with Ramsey spectroscopy for 1- and 2-dimensional lattice confinement. In particular, we show how details of the spectroscopy (e.g. pulse area, dark time) affect the collision shifts and, in some cases, can be used to zero the resulting shift.

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