

Abstract Submitted  
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**Ramsey Spectroscopy on Ultra-Cold Alkaline-Earth Atoms**

CHESTER RUBBO, ALEXEY GORSHKOV, ANA REY — We consider ultra-cold fermionic alkaline-earth atoms trapped in a deep 3D optical lattice. In these systems, the many-body dynamics driven by the interplay between nuclear spins and two orbital electronic degrees of freedom ( $^1S_0$  and  $^3P_0$ ) can be modeled by an effective two-band Hubbard model [Gorshkov, et al. quant-ph/0812.3660]. We analyze the role of interactions, entanglement generation, and inhomogeneities (differential g-factors, vector/tensor light shifts, g etc.) on the sensitivity of precision spectroscopy with these atoms.

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