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Supersolid-like states in a spin-orbit coupled Bose-Einstein condensate¹ THOMAS BERSANO, VANDNA GOKHROO, PETER ENGELS, Washington State Univ — Spin-orbit coupled BECs provide a powerful platform to investigate exotic quantum states. Among these, supersolids are particularly intriguing, exhibiting both superfluid and solid-like properties. In our experiment, we employ a Raman dressing scheme to generate a spin-orbit dispersion. States with different quasi-momentum are then coherently coupled by employing a suitably tailored optical lattice, effectively generating supersolid-like states. We demonstrate the coherent coupling mechanism by measuring Rabi oscillations between two quasi-momentum states. The current status and future direction of the experiment are discussed.

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