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Superfluidity of Bosons in Optical lattices with Spin-Orbit coupling[1] DANIEL SHEEHY, QINQIN LU, Louisiana State University — Recent experimental and theoretical work has explored artificial spin-orbit coupling induced among two species of boson. Here we examine superfluidity of a cold gas of bosons with spin-orbit coupling in a periodic optical lattice, in the presence of additional short-range interactions. We compute the density distribution after free expansion from the lattice as a probe of superfluidity, and phase transitions, of the trapped gas.

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