



# Theoretical description of two ultracold atoms in finite 3D optical lattices using realistic interatomic interaction potentials

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A theoretical approach is described for an exact numerical treatment of a pair of ultracold atoms interacting via a central potential that are trapped in a finite three-dimensional optical lattice. The coupling of center-of-mass and relative-motion coordinates is treated using an exact diagonalization (configuration-interaction) approach. The orthorhombic symmetry of an optical lattice with three different but orthogonal lattice vectors is explicitly considered as is the Fermionic or Bosonic symmetry in the case of indistinguishable particles.

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