States of one and two atoms in a rotating ring lattice OTIM
ODONG, JUHA JAVANAINEN, U. of Connecticut — We study the states of one
and two bosonic atoms in a rotating ring lattice using a Hubbard type model, includ-
ing phases on the tunneling matrix elements that depend on the rotation speed. The
combination of the topology of the ring and the twisting boundary conditions of the
wave functions due to the rotation leads to a rich phenomenology and novel methods
to control the atoms in the lattice. For instance, the physics qualitatively depends
on the parity of the number of lattice sites, and one can tailor the preparation of
both one-atom and lattice dimer states by varying the rotation speed.

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