

Berry's Phase for Ultracold Atoms in an Accelerated Optical Lattice

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Berry's phase is investigated for ultracold atoms in a frequency modulated optical lattice. It is shown that Berry's phase appears due to Bloch oscillation and the periodic motion of the optical lattice. Particularly, Berry's phase for ultracold atoms under the gravitational force in an oscillating tight-binding optical lattice is calculated analytically. It is found that the Berry's phase depends linearly on the amplitude of the oscillation of the optical lattice.

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