

Berry phase from atomic orbital

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We examine properties of the Berry phase in multi-orbital cubic systems with both time-reversal and inversion symmetries. We find that the Berry curvature near the Gamma point in the Brillouin zone is proportional to the atomic angular momentum \mathbf{L} . Considering that the Berry curvature acts as an effective magnetic field in momentum space, this result implies that trajectories of accelerated electrons are bent sideways as if an external magnetic field is applied parallel to \mathbf{L} .