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Density of States for Warped or non-Warped Energy Bands¹ NICHOLAS MECHOLSKY, LORENZO RESCA, IAN PEGG, Catholic Univ of America, MARCO FORNARI, Central Michigan University — The goal of this talk is to investigate when band warping affects density-of-states effective mass. Further, band "corrugation," a form of band warping referring to energy dispersions that deviate "more severely" from being twice-differentiable at isolated critical points, may also correlate in different ways with density-of-states effective masses and other band warping parameters. In this talk, an angular effective mass formalism is developed and used to study the electronic density of states of warped and non-warped energy bands towards an application in thermoelectric transport design. We demonstrate effects of band warping and prove the superiority of the angular effective mass treatment for valence energy bands in cubic materials. We explore examples that can also be critical to precisely distinguish the contributions due to band warping and to band non-parabolicity in non-degenerate bands of thermoelectric materials that have a consequent practical interest.

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