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The effect of low-symmetry defects in semiconductors on spin Hall conductivity[1] MATTHEW D. MOWER, MICHAEL E. FLATTÉ, University of Iowa — We study the effect of low-symmetry defects in semiconductors on the spin Hall conductivity of carriers. It has previously been shown that these defects, e.g. DX centers in direct-gap III-V semiconductors, couple to carriers via a rather large, novel spin-orbit interaction. Compared to translational- or bulk-asymmetry based spin-orbit interactions, this spin-orbit interaction considerably enhances the carrier spin relaxation rate. However, we find that it does not make appreciable contributions to transverse spin currents. At the level of the 1st and 2nd Born approximations, there is neither side-jump nor skew scattering from these defects. Thus, we imagine a scenario where shifting impurities between substitutional and interstitial (low symmetry) positions quickly relaxes a spin system with negligible effects on existing transverse spin currents.

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Matthew D. Mower
University of Iowa

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