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Large relativistic spin splittings in the band structures of III-V and II-VI semiconductors ATHANASIOS N. CHANTIS, Los Alamos Natl. Lab., Los Alamos NM, AXEL SVANE, NIELS E. CHRISTENSEN, University of Aarhus, Denmark, MANUEL CARDONA, Max Planck Inst. FKF, Stuttgart, Germany — The Quasiparticle Self-consistent GW approximation, including spin-orbit coupling has been used to derive the spin splittings over the full Brillouin zone (BZ) for several III-V and II-VI semiconductors. Also, the magnitude and direction of the associated spin polarization of the states were determined. The spin splitting effect is a consequence of the non-centrosymmetric structure of these semiconductors. They are small in the vicinity of the center of the BZ (order of meV), but reach for the lowest conduction band in some parts of the BZ very large values, order of 1 eV. The locations of the largest splittings and their physical origin depend on the compound.

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