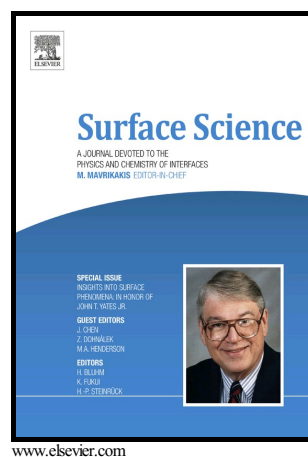


Spin-orbit band gaps and destruction of Dirac cones

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Spin-orbit band gaps and destruction of Dirac cones

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The relativistic band structures of the IV group honeycomb monolayers, from graphene to plumbene (C-Si-Ge-Sn-Pb), have been calculated within DFT in Local Density Approximation (LDA). Basing on the obtained results, we suggest that the spin-orbit coupling leads to opening of the band gaps and therefore will unavoidably cause the destruction of the perfect shape of Dirac cones which is responsible for the existence of the massless Fermions. The applicability of ordinary non-relativistic DFT calculations of bands for graphene-like layered structures is discussed in this regard.

Graphical abstract

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