

Different types of magnetic edge configurations in selected graphene-like nanoribbons

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Theoretical studies of electronic and magnetic properties of selected graphene-like nanolayers are presented. The method is based on a tight-binding type Hamiltonian with Hubbard corrections. The main attention is focused on the zigzag nanoribbons and their magnetic configurations. It is shown that the latter determine energy band structures and may lead to a half-metallic behavior of some graphene-like systems. Interestingly, apart from the well-known parallel and antiparallel arrangements of the ferromagnetic edges, it is also possible that only one edge is ferromagnetic and the other is paramagnetic. Such a one-edge magnetic configuration may appear in graphene, stanene and phosphorene for properly chosen gating and edge-doping.