

Comparative studies of graphene and phosphorene zigzag edge nanoribbons with antidots

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Recent studies on various graphene-like nanoribbons show that magnetic moments can appear on external zigzag edges. These magnetic moments critically influence physical properties of the nanoribbons. The effect strongly depends on relative magnetization directions of the two opposite ribbon's edges [1, 2]. Here, it is shown that magnetic moments can also appear in the nanopores (antidots). Notably, these extra internal magnetic moments can strongly influence both electronic and magnetic properties of the nanoribbons. Phosphorene and graphene nanoribbons with antidots are compared with each other. The former has got large external as well as internal magnetic moments, and seems to be very promising for future spintronic applications due to its half-metallic properties [3] for all considered antidot sizes.

References:

- [1] J. L. Lado and J. Fernandez-Rossier, Phys. Rev. Lett. 113 (2014) 027203.
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- [3] S. Krompiewski, J. Magn. Magn. Mat., 560 (2022) 169557.