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Hybrid Monte Carlo simulations of Graphene in presence of vacancies

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Tight-binding model of Graphene with vacancies in crystal structure was studied within the framework of Hybrid Monte Carlo simulations.
Antiferromagnetic ordering is observed in the vicinity of the vacant sites. Mass gap is extracted from the calculations of the two-point Euclidean Green function. It is demonstrated that even a relatively small concentration of vacancies can lead to opening a mass gap in monolayer Graphene.

Primary author: Dr ULYBYSHEV, Maksim (Regensburg University)

Presenter: Dr ULYBYSHEV, Maksim (Regensburg University)

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