

Hund interaction induced superconductivity in proximitized Bernal bilayer graphene

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The impact of proximity-induced spin-orbit coupling and Hund interactions on the correlated phase diagram of Bernal bilayer graphene (BBG) is theoretically investigated. Using an effective ab initio-fitted BBG/WS₂ van der Waals heterostructure model, Coulomb and Hund interactions are incorporated through the random-phase approximation to examine possible correlated phases across various displacement fields, doping levels, and temperatures. Findings indicate that Hund interaction, combined with intervalley and Stoner fluctuations, can induce superconductivity in proximitized BBG. Spin-orbit coupling, in turn, removes the degeneracy of the superconducting state in the spin subspace, causing a splitting into triplet and singlet states.

Figures

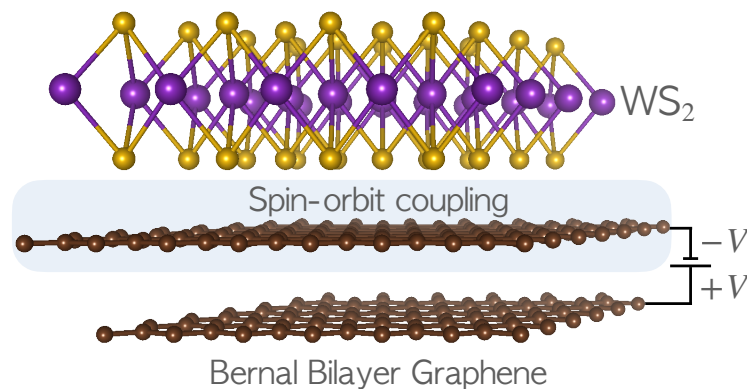


Figure 1: Scheme of BBG/WS₂ heterostructure which proximitize the BBG by spin-orbit interaction

References

1. Y. Zhumagulov, D. Kochan, J. Fabian, Phys. Rev. Lett. 132 (2024) 186401.
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