

Abstract Submitted
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Overcoming Doping Difficulty in Graphene via Substrate¹ SU-HUAI WEI, BING HUANG, HONGJUN XIANG, National Renewable Energy Laboratory — Controlling the type and density of charge carriers by doping is the key step for developing graphene electronics. However, direct doping of graphene is rather challenge. Using first-principles method we find that doping could be strongly enhanced in epitaxial graphene grown on silicon carbide substrate. Compared to free-standing graphene, the formation energies of the dopants can decrease by as much as 8 eV. The type and density of the charge carriers of epitaxial graphene layer can be effectively manipulated by suitable dopants and surface passivation. More importantly, contrasting to the direct doping of graphene, the charge carriers in epitaxial graphene layer are weakly scattered by dopants due to the spatial separation between dopants and conducting channel.

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