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Berry-phase effect on reflection amplitude in bilayer graphene with potential step SUNGHUN PARK, H.-S. SIM, KAIST — We theoretically study the phase of the reflection amplitude of an electron at a lateral potential step in Bernal-stacked bilayer graphene [1]. The phase shows an anomalous jump of π, as the electron incidence angle (relative to the normal direction to the step) varies to pass $\pm\pi/4$. The jump is attributed to the Berry phase associated with the pseudospin-1/2 of the electron. This Berry-phase effect is robust against the band-gap opening due to the external gates generating the step, and can be observed in an interferometry setup.

[1] Sunghun Park and H.-S. Sim, Phys. Rev. Lett. 103, 196802 (2009).

Sunghun Park
KAIST

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