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Numerical study of electronic transport in a graphene superlattice DI WU, WEI-QIANG CHEN, FU-CHUN ZHANG, Department of Physics and the Center of Theoretical and Computational Physics, The University of Hong Kong, Hong Kong, China — Using tight-bonding model, We calculate the transport properties of charge carriers through graphene superlattices consisting of monolayer or bilayer graphene with an applied external potential barrier. Emphasis is placed on inter-valley scattering between two inequivalent Dirac cones in our systems. It is shown that transmission probabilities for two kinds of graphene structure exhibit different features due to distinct intrinsic properties of charge carriers in these superlattices. The co-existence of inter-valley and intra-valley scattering in the monolayer lattice declines the phenomenon of perfect transmission predicted by Klein paradox.

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