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Scattering theory for graphene plasmons near edges and interfaces ALEKSANDR RODIN, MICHAEL FOGLER, UCSD — Motivated by recent infrared nano-imaging experiments, we study eigenmodes of graphene plasmons near sample boundaries, corners, and interfaces. Such modes can be understood as standing-wave patters formed by multiple scattering of elementary waves. We derive the rules of the corresponding scattering theory by analyzing the integro-differential equation for the plasmon dynamics. Our analytical results include the solution for the edge reflection problem in uniform graphene and a quasiclassical formalism for graphene of slowly varying density. Numerical simulations are employed for more complicated boundary geometries (wedge, constriction, etc.) and for singular density distributions that exist near the edge of a gated graphene.

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