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Theory of surface plasmons and surface-plasmon polaritons

J M Pitarke[1,2], V M Silkin[2], E V Chulkov[2,3] and P M Echenique[2,3]

[1] Materia Kondentsatuaren Fisika Saila, Zientzi Fakultatea, Euskal Herriko Unibertsitatea, 644 Posta kutxatila, E-48080 Bilbo, Basque Country, Spain
[2] Donostia International Physics Center (DIPC) and Unidad de Física de Materiales CSIC-UPV/EHU, Manuel de Lardizabal Pasealekua, E-20018 Donostia, Basque Country, Spain
[3] Materialen Fisika Saila, Kimika Fakultatea, Euskal Herriko Unibertsitatea, 1072 Posta kutxatila, E-20080 Donostia, Basque Country, Spain

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Abstract

Collective electronic excitations at metal surfaces are well known to play a key role in a wide spectrum of science, ranging from physics and materials science to biology. Here we focus on a theoretical description of the many-body dynamical electronic response of solids, which underlines the existence of various collective electronic excitations at metal surfaces, such as the conventional surface plasmon, multipole plasmons and the recently predicted acoustic surface plasmon. We also review existing calculations, experimental measurements and applications.

This article was invited by Professor M Finnis.

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