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Plasmon Hybridization of a thin metallic film TAE-HO PARK, PETER NORDLANDER, Department of Physics and Astronomy, Rice University — We investigate the surface plasmon modes of a thin metallic film using the Plasmon Hybridization method and solving Maxwell's equations. In the electrostatic limit, we show that the high energy plasmon mode is the antibonding mode in which surface charges are antisymmetrically distributed, and the low energy mode is the bonding mode in which surface charges are symmetrically distributed. In the thin film, secondary charges which are induced from the primitive plasmons on the other film surface play an important role to determine which plasmon mode has the higher or lower energy. Furthermore, we discuss how the secondary charges affect the propagation length of the surface plasmon by calculating the imaginary parts of the surface plasmon wave vectors.

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