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Surface plasmon propagation along smeared metal-dielectric interfaces ANDRII BOZHKO, VLADIMIR DRACHEV, ARKADII KROKHIN, University of North Texas — Propagation of surface plasmons (SPs) along metal-dielectric interfaces is studied for nano-width metallic films with accounting for interface smearing. Smearing is modelled by electron cloud with density decaying exponentially from the metal surface. The level of smearing is controlled by external electric field. The dispersion and electromagnetic field profile of SPs is calculated numerically for different asymmetric smearings. At some point near the smeared interfaces, where dielectric constant is close to zero, strong enhancement of electric field is predicted. Asymmetry of interface smearings breaks the P-symmetry of the system that leads to frequency splitting of SPs degenerated eigenstates and as a result a doublet of resonant states appears. Also, the perturbation theory which explains the features of dispersion spectrum and field profile is developed.

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