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Broadband wide angle nearly perfect absorption with polarization-independence in plasmonic absorber based on multiple surface plasmon resonances SZE FUNG LEE, KING CHUN LAI, KIN WAH YU, The Chinese University of Hong Kong — Nearly perfect absorption (NPA) of electromagnetic waves is useful in building photovoltaic cells, sensors and filters etc. Therefore designs of nearly perfect absorber based on different geometries have been proposed to yield NPA, with different operating frequency bandwidths, sensitivities to angle of incidence (AOI) and polarization of incident light. In this work, a design of broadband, wide AOI and polarization-independent nearly perfect absorber is proposed. The absorber is composed of a composite layer which generates multiple resonance, coated on a reflecting metal. The absorbance is computed to confirm NPA for TM and TE modes. The absorbance depends also on the thickness of the composite layer and this dependence is explained by the hybridized surface plasmon polariton (HSPP) formed inside the absorber. Particularly for TE mode, the fast HSPP wave (with phase velocity larger than the speed of light in vacuum) which coupled efficiently with incident light, can only be generated for proper thickness of layer. The proposed absorber can be one of the candidates for building light harvesting devices because of its efficient energy collection.

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