

Abstract Submitted  
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**Band Structures of Plasmonic Polarons** FABIO CARUSO, HENRY LAMBERT, FELICIANO GIUSTINO, University of Oxford — In angle-resolved photoemission spectroscopy (ARPES), the acceleration of a photo-electron upon photon absorption may trigger shake-up excitations in the sample, leading to the emission of phonons, electron-hole pairs, and plasmons, the latter being collective charge-density fluctuations. Using state-of-the-art many-body calculations based on the ‘*GW* plus cumulant’ approach, we show that electron-plasmon interactions induce plasmonic polaron bands in group IV transition metal dichalcogenide monolayers (MoS<sub>2</sub>, MoSe<sub>2</sub>, WS<sub>2</sub>, WSe<sub>2</sub>). We find that the energy vs. momentum dispersion relations of these plasmonic structures closely follow the standard valence bands, although they appear broadened and blueshifted by the plasmon energy. Based on our results we identify general criteria for observing plasmonic polaron bands in the angle-resolved photoelectron spectra of solids.

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