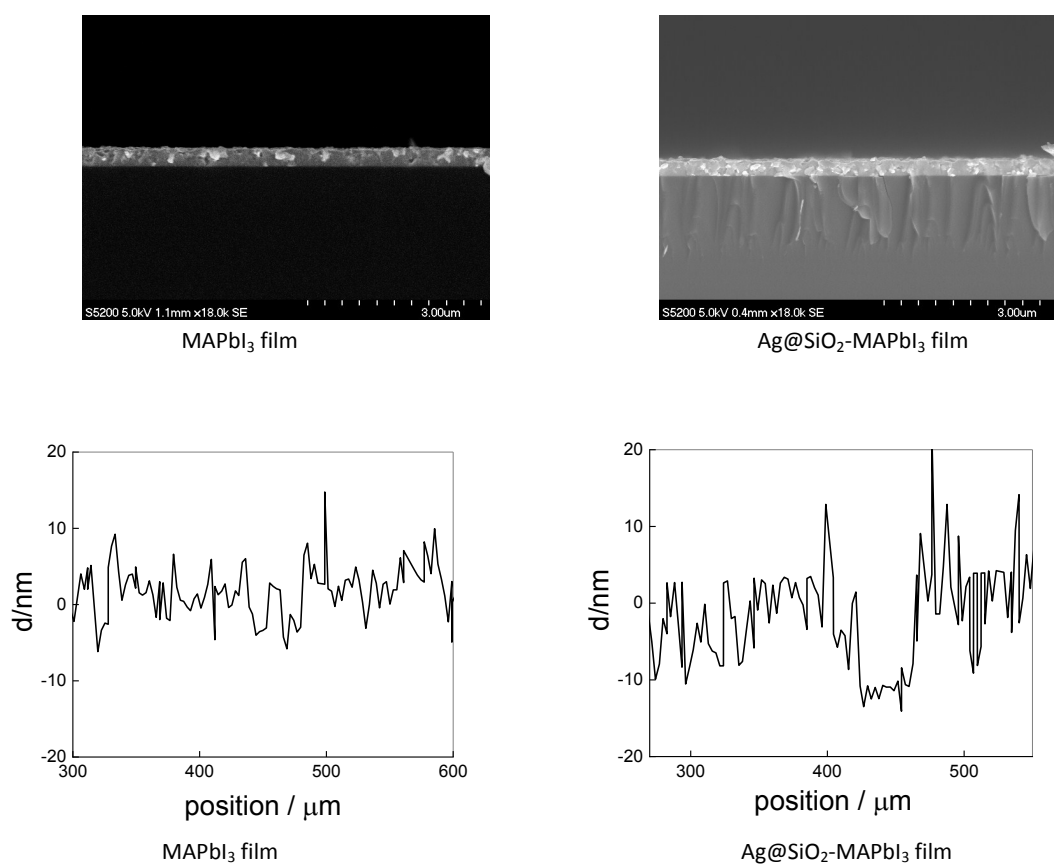


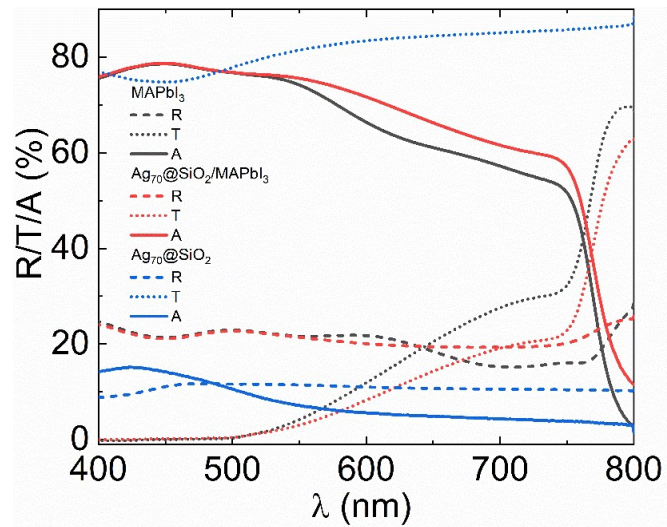
ELECTRONIC SUPPLEMENTARY INFORMATION

## Localized Surface Plasmon Effects on the Photophysics of Perovskite Thin Films Embedding Metal Nanoparticles

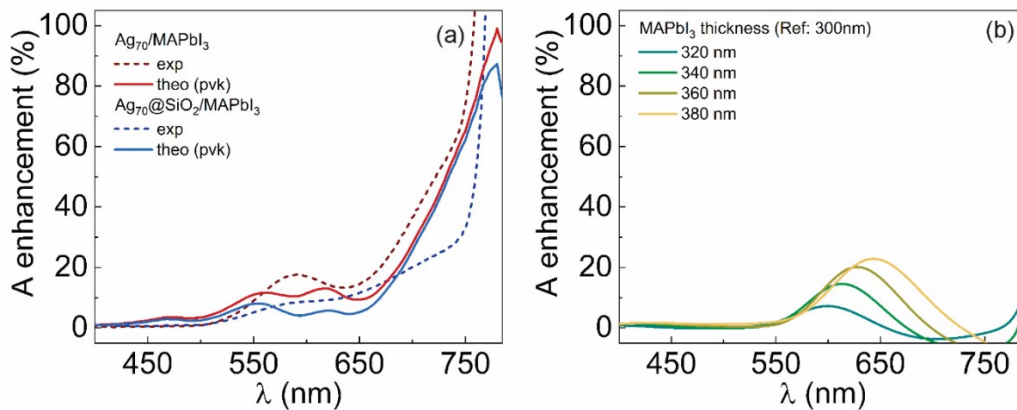
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Hernán Míguez \**



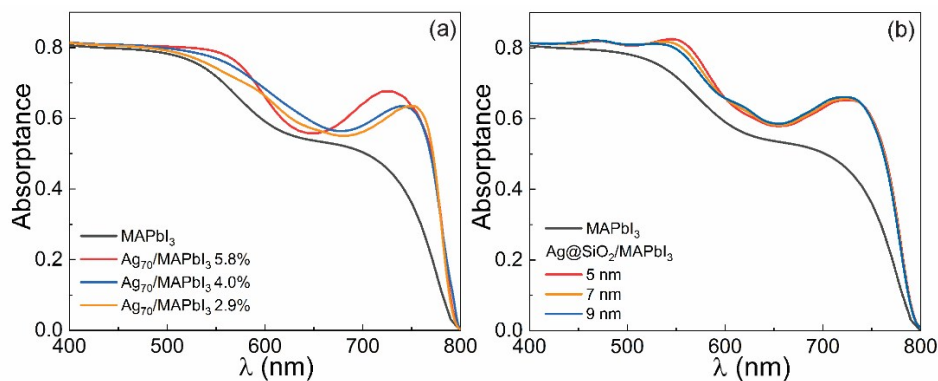
**Fig S1.** (Top) Cross-section FESEM images and (Bottom) roughness profiles of MAPbI<sub>3</sub> (left) and Ag@SiO<sub>2</sub>-MAPbI<sub>3</sub> (right) thin films.



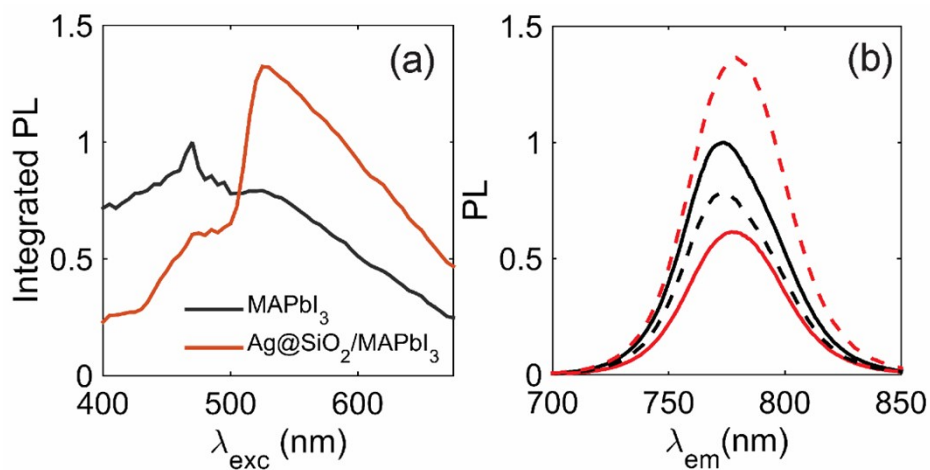
**Figure S2.** Total reflectance (R, dashed lines), total transmittance (T, dotted lines) and total absorptance (A, calculated as  $A = 100 - R - T$ , solid lines) for a 300 nm thick pure MAPI film (black lines), a quartz substrate coated with a layer of np-Ag@SiO<sub>2</sub> (blue lines), and a np-Ag@SiO<sub>2</sub> loaded MAPI film (red lines). Measurements are made employing an integrating sphere attached to a spectrophotometer.



**Figure S3.** (a) Experimental (dashed lines) and simulated (solid lines) absorptance (A) enhancement spectra attained for np-Ag@SiO<sub>2</sub> and np-Ag loaded 300 nm thick MAPI films taken a 300 nm thick pure film as a reference. (b) Absorptance enhancement spectra calculated for pure MAPI films whose thickness range between 320 nm and 380 nm, attained taken as 300 pure MAPI film as reference. In all cases, integrated absorptance enhancements reaches only a few percents.



**Figure S4.** (a) Simulated absorptance for 300 nm thick MAPI films loaded with different concentrations of np-Ag, namely, 0% (black line), 2.9% (orange line), 4.0% (blue line) and 5.8% (red line). (b) Effect of the thickness of the SiO<sub>2</sub> shell on the absorptance of Ag@SiO<sub>2</sub> loaded 300 nm thick perovskite film (particle concentration 5.8 %); MAPI reference film is plotted again as a black line.



**Figure S5.** (a) Normalized experimental integrated photoluminescence intensity vs excitation wavelength for a 300 nm thick Ag@SiO<sub>2</sub> loaded perovskite film (red line) and a 300 nm thick pure MAPI film (black line), for  $\lambda_{em} = 780$  nm and  $\lambda_{em} = 773$  nm, respectively (PL peaks at different wavelengths in sample and reference); curves are normalized to the maximum integrated PL measured in the MAPI film. (b) Normalized PL spectra measured for a 300 nm thick Ag@SiO<sub>2</sub> loaded perovskite film (red line) and a 300 nm thick pure MAPI film (black line) excited at  $\lambda_{exc}=470$  nm (at which no localized SPR occurs, solid line) and  $\lambda_{exc}=530$  nm (within the region at which SPR effects are expected and observed, dashed line).