## **Supporting Information**

## Plasmon-exciton coupling in dielectric-metal hybrid nanocavities with an embedded two-dimensional material

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**Fig. S1.** Electric field distributions in the XY plane calculated for hybrid nanocavities composed of Au films with different thicknesses (t). Forward scattering: (a) t = 10 nm, (b) t = 50 nm, and (c) t = 80 nm; Backward scattering: (d) t = 10 nm, (e) t = 50 nm, and (f) t = 80 nm. The forward and backward scattering spectra are shown in (g) and (h), respectively.



Fig. S2. (a) Forward scattering spectra measured at different incidence angles ( $\theta$ ) of  $0^{\circ}$  and  $33^{\circ}$ . (b)

Backward scattering spectra measured at different incidence angles ( $\theta$ ) of  $0^{\circ}$  and  $33^{\circ}$ .



**Fig. S3.** (a) Forward and backward scattering spectra calculated for a hybrid nanocavity composed of a Si nanoparticle with d = 175 nm and without a WS<sub>2</sub> monolayer. (b) Forward and backward scattering spectra calculated for a hybrid nanocavity composed of a Si nanoparticle with d = 175 nm and with a WS<sub>2</sub> monolayer. (c) Forward and backward scattering spectra measured for a hybrid nanocavity without a WS<sub>2</sub> monolayer. (d) Forward and backward scattering spectra measured for a hybrid nanocavity mithout a WS<sub>2</sub> monolayer. (d) Forward and backward scattering spectra measured for a hybrid nanocavity with a WS<sub>2</sub> monolayer.