Supporting Information

Broad-band Three Dimensional Nanocave ZnO Thin Film Photodetectors Enhanced by Au Surface Plasmon Resonance

Mengwei Sun,a Zhen Xu,b Min Yin,*,b Qingfeng Lin,c Linfeng Lu,b Xinzhuo Xue,b Xufei Zhu,a Yanxia Cui,d Zhiyong Fan,c Yiling Ding,b Li Tian,b Hui Wang,b Xiaoyuan Chen,b Dongdong Li*,b
**Fig. S1.** The EDS result of ZnO-Au thin film.
Fig. S2. The SEM cross-sectional views of (a) pattered and (b) flat ZnO films.
Fig. S3. (a1, b1) Atomic Force Microscope (AFM) images and corresponding (a2, b2) depth profiles of patterned (a1, a2) ZnO and (b1, b2) ZnO-Au film by using the guideline in Figs a1 and b1.
**Fig. S4.** (a) Transmission electron microscopy (TEM) and (b) high-resolution transmission electron microscopy (HRTEM) images of ZnO nanoparticles.
Fig. S5. (a) TEM image of Au nanoparticles and (b) the histogram of Au nanoparticles distribution
Fig. S6. A HRTEM image of Au nanoparticle.
Fig. S7. The absorption spectra of ZnO based photodetectors on Si/SiO$_2$ substrates as well as the bare Si/SiO$_2$ substrate.
Fig. S8. The absorption spectrum of ZnO-Au sol.