## Saturable absorption and the changeover from saturable absorption to reverse saturable absorption of MoS<sub>2</sub> nanoflake array films

## **Supplementary Information**

Qiuyun Ouyang, Hailong Yu, Kai Zhang, Yujin Chen\*

<sup>\*</sup> Corresponding author, E-mail: chenyujin@hrbeu.edu.cn

## I. AFM image of MoS<sub>2</sub> nanoflake array film

Fig. S1 and S2 show atomic force microscopy (AFM) image of MoS<sub>2</sub> nanoflake array film on FTO quartz glass substrate and glass substrate, respectively. AFM image should provide more detailed information on the domain structure and thickness of MoS<sub>2</sub> nanoflake array film. From Fig. S1 and S2, the thicknesses of MoS<sub>2</sub> nanoflake array film on FTO quartz glass substrate and glass substrate can be obtained as about 730 and 224 nm, respectively.

Fig. S3 shows the scanning electron microscopy (SEM) image of FTO glass substrate. From Fig. S3, the thickness of  $SnO_2$  layer for FTO glass substrate can be obtained as about 400 nm.



Fig. S1 AFM image of MoS2 nanoflake array film on FTO glass substrate



Fig. S2 AFM image of  $MoS_2$  nanoflake array film on quartz glass substrate



Fig. S3 SEM image of FTO glass substrate