Supporting Information

$FeVO_4$-based solution- processed all oxide self-biased fast photodetectors.

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AFFILIATION

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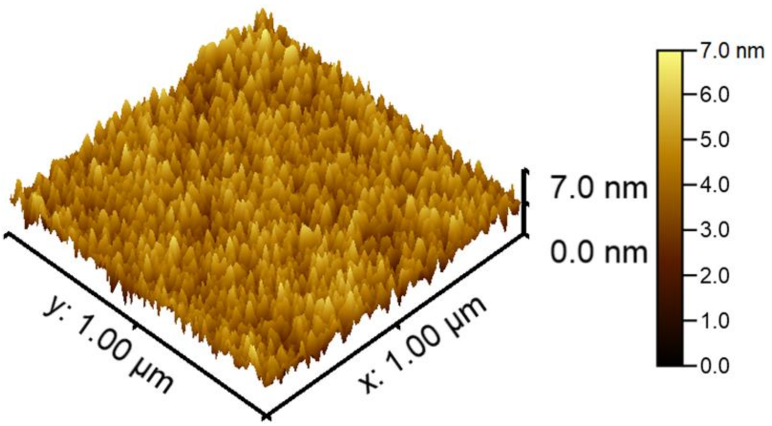

FIG. S1. Three-dimensional AFM image of $FeVO_4$ (FVO) thin film on a quartz substrate.

Table S1. Atomic percentages of the constituent elements in the solution-processed FVO thin films.

Element name	Atomic (%)
Fe	16.04
V	15.09
O	62.56
C	6.31

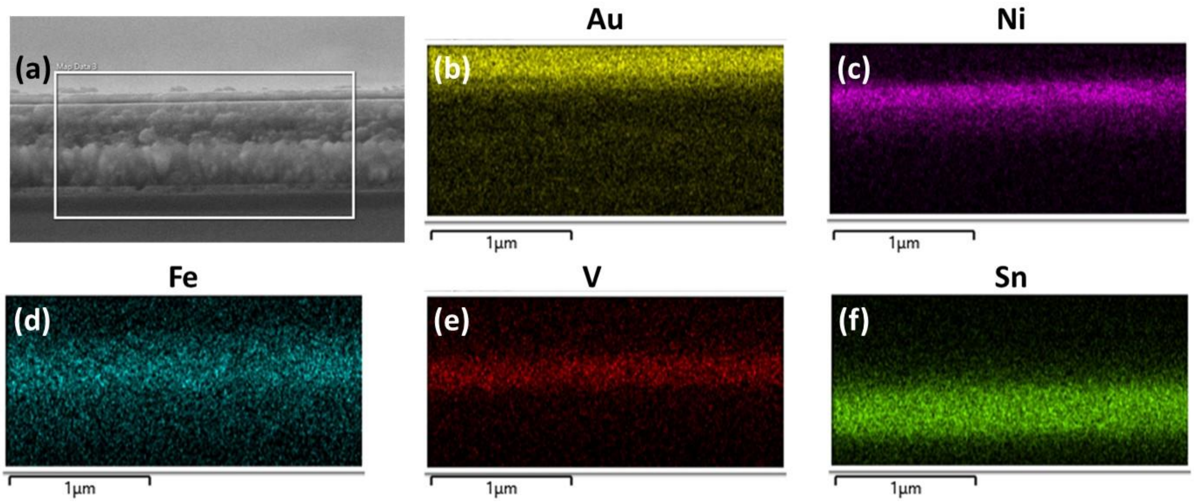

FIG. S2. (a) Cross-section FESEM image of FVO-based photodetector. Corresponding EDS elemental mapping graphs of (b) Au, (c) Ni, (d) Fe, (e) V and (f) Sn are present in the bottom FTO substrate.

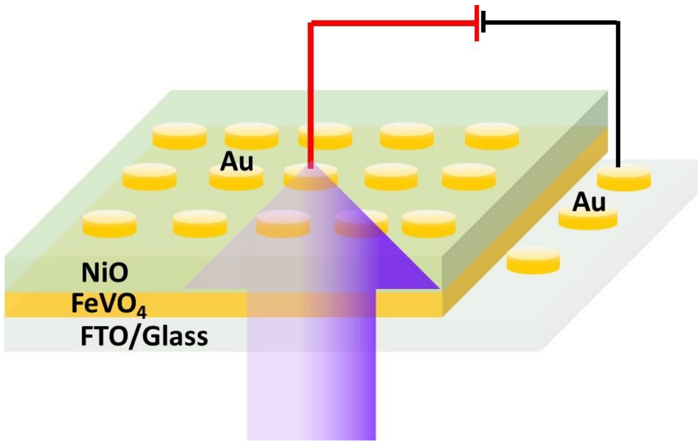

FIG. S3. The schematic of the electrical measurement for n-FVO/p-NiO photodetector.

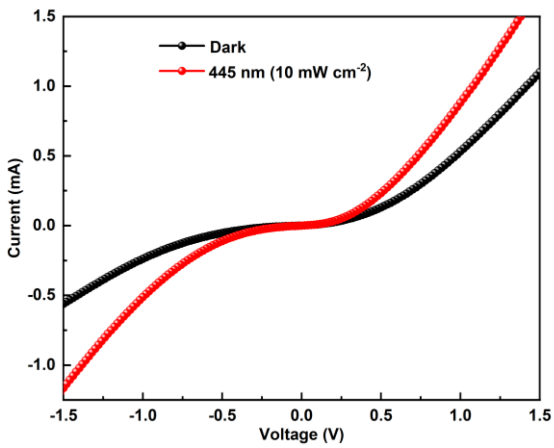

FIG. S4. *I-V* characteristics of the n-FVO/p-NiO heterojunction device under dark and visible light (445 nm, 10 mW cm^{-2}).

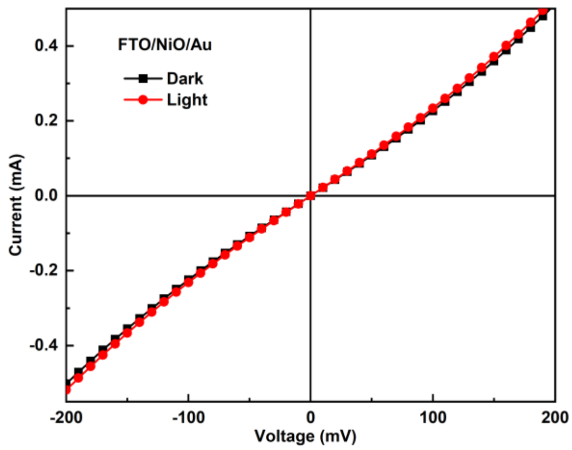

Fig. S5. *I-V* characteristics of FTO/NiO/Au device under dark and 445 nm light illumination.

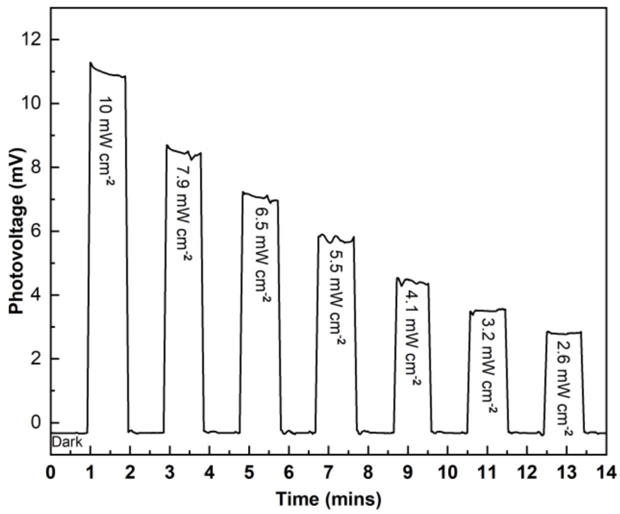

Fig. S6. The photovoltage-time curve with the change of incident light intensity.

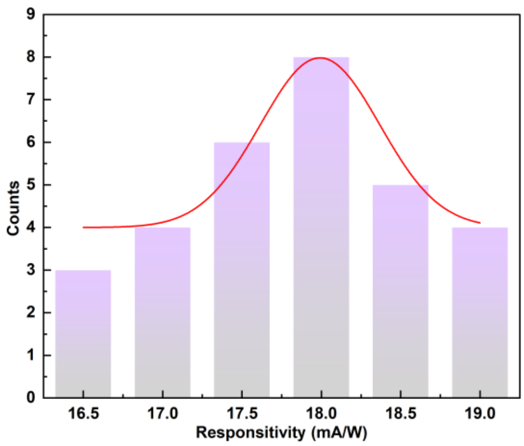

Fig. S7. Histogram showing the average responsivity (R) extracted from the *J–V* curves of 30 FVO-based photodetectors.

Table S2. Comparison diagram of representative solution-processed self-biased all-oxide photodetectors.

Device	Wavelength (nm)	Intensity (mW cm^{-2})	Photoresponsivity (mA W^{-1})	Detectivity (Jones)	Rise time (ms)	Fall time (ms)	Ref.
$BiFeO_3/XTiO_3$ (X-Sr, Zn, Pb)	500	8	1.3	3×10^{10}	19	23	1
$CuBi_2O_4$/PZT	425	0.00751	0.24	2.40×10^{10}	24	46	2
ZnO NRs/Cu_2O	425	25	8.2	-	140	360	3
Co_3O_4–ZnO	520		8.3	3.14×10^{12}	20	90	4
FVO/NiO (This work)	445	6.5	18	5.3×10^{10}	46	47	
Au/$BiVO_4$/Pt	520	150	0.3	5×10^{9}	16.5	5.8	5
Pt/LNO/$Bi_{1.5}FeO_3$/Au	500	0.2	1.515	1.35×10^{11}	6	15	6

References

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