Supplementary Information

Solution Phase van der Waals Epitaxy of ZnO Wire Arrays

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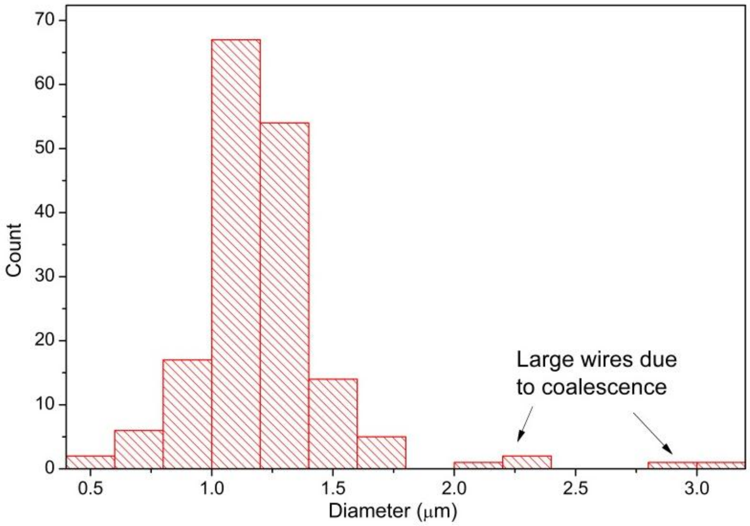

Fig. S1 Diameter distribution of as-synthesized ZnO wire array. There exist a few wires with distinctly large diameter out of the distribution and they are produced from merging of smaller wires.

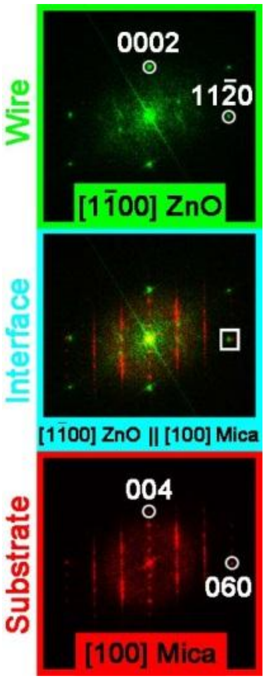

Fig. S2 Power spectra of ZnO (pseudocolored in green), mica substrate (in red) and the interface (color-combined) viewed in $[1\bar{1}00]_{ZnO} \| [100]_{Mica}$ zone axis.

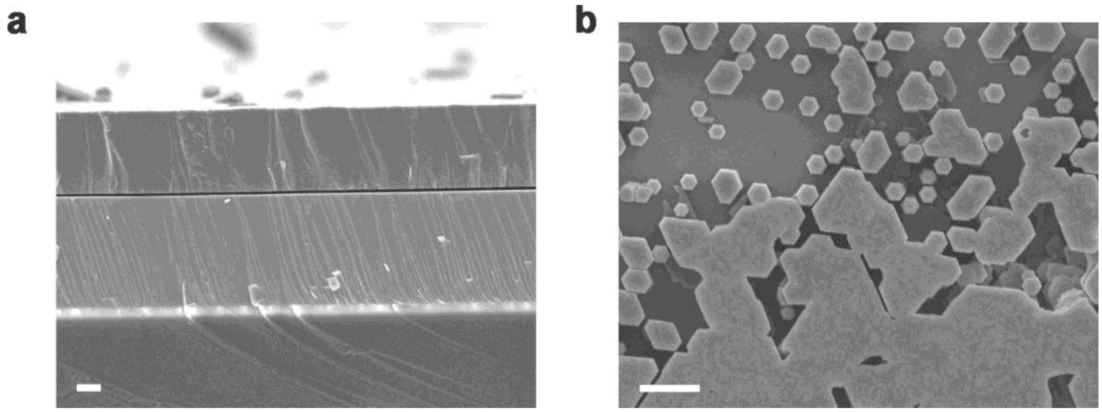

Fig. S3 SEM characterizations of ZnO film grown on single crystal GaN substrate. (a) 90° tilted view image to show the formation of a complete film. (b) Top view image at a defect to reveal the coalescence of hexagonal ZnO units. All scale bars: 1 μm.

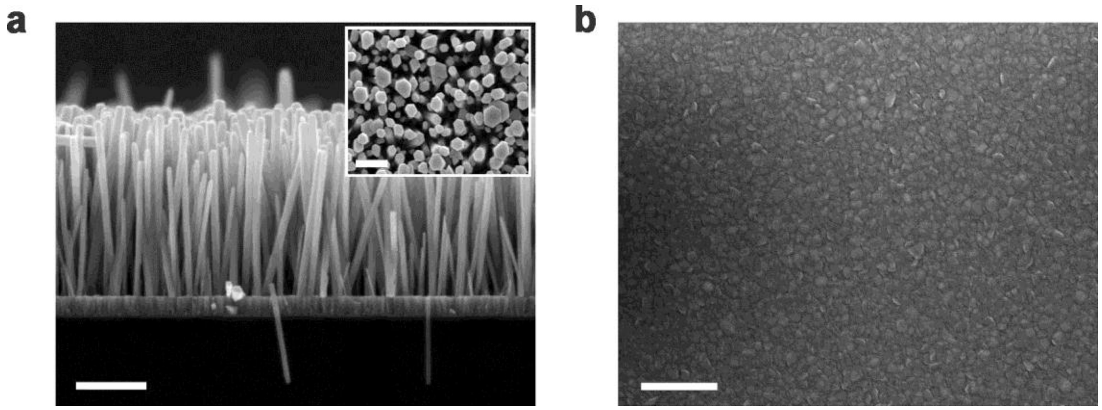

Fig. S4 SEM characterizations of ZnO film grown on ZnO-seeded Si substrate and as sputtered seeds. (a) 90° tilted view image to show the formation of array with diameter around 100 nm. The inset is a top view image to show the random orientation among individual nanowires. (b) Top view SEM image to show the grain size. All scale bars: 500 nm.

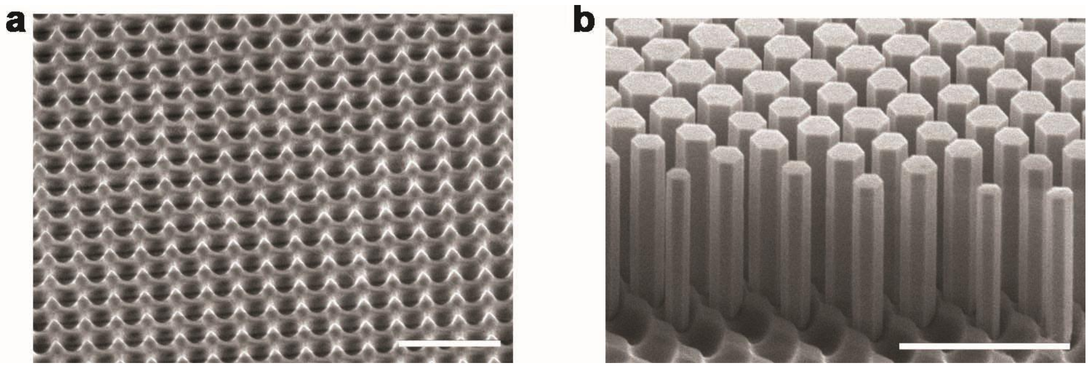

Fig. S5 Pattern formed by laser interference lithography and corresponding growth of ordered array. (a) 45° tilted view SEM image to show the fabricated periodic pattern. (b) SEM image with 60° tilted view to show the each nanowire is grown from individual hole. All scale bars: 5 μm.

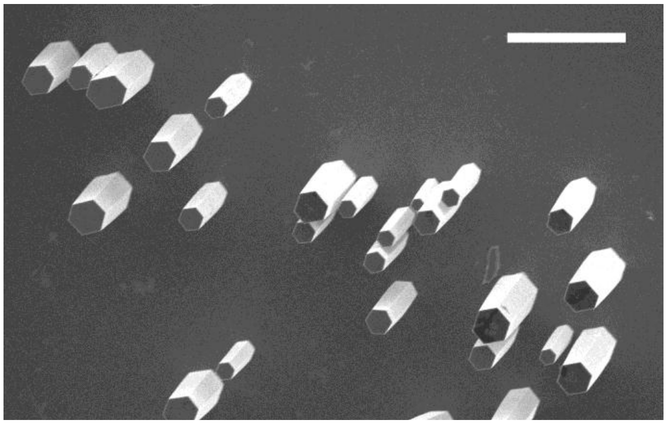

Fig. S6 Top view SEM image to show the ZnO wires grown on Bi_2Se_3 flakes, which were prepared by scotch-tape method. Notice the in-plane alignment among those wires. The growth conditions were kept at the same with wire array grown on mica substrate. Scale bar: 10 μm.