

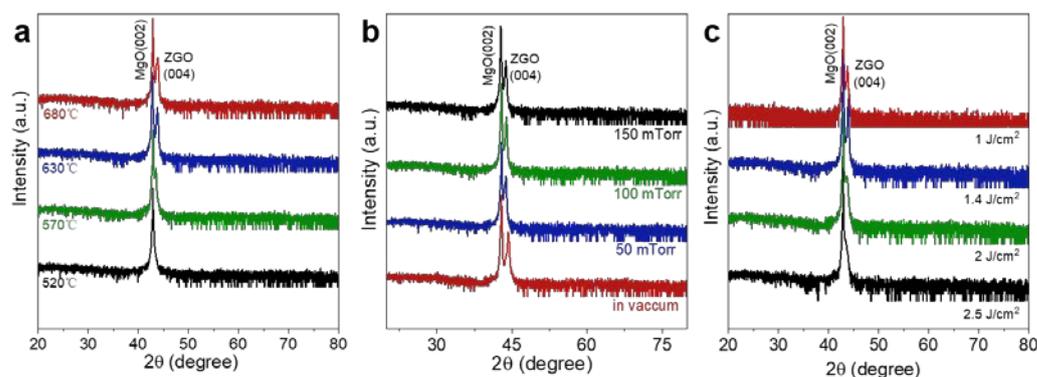
# Supplementary Materials: Epitaxial Growth and Stoichiometry Control of Ultrawide Bandgap ZnGa<sub>2</sub>O<sub>4</sub> Films by Pulsed Laser Deposition

Liu Wang,<sup>1,2</sup> Wenrui Zhang<sup>2,\*</sup>, Ningtao Liu<sup>2</sup>, Tan Zhang<sup>2</sup>, Zilong Wang<sup>2</sup>, Simiao Wu<sup>2</sup> and Zhaolin Zhan,<sup>1,\*</sup> and Jichun Ye<sup>2,\*</sup>

<sup>1</sup> School of Material Science and Engineering, Kunming University of Science and Technology, Kunming 650093, Yunan, China; wangliu@nimte.ac.cn

<sup>2</sup> Ningbo Institute of Material Technology and Engineering, Chinese Academy of Sciences, Ningbo 315201, Zhejiang, China; liuningtao@nimte.ac.cn (N.L.); zhangtan@nimte.ac.cn (T.Z.); wangzilong@nimte.ac.cn (Z.W.); wusimiao@nimte.ac.cn (S.W.)

\* Correspondence: zhangwenrui@nimte.ac.cn (W.Z), zl\_zhan@sohu.com (Z.Z.), jichun.ye@nimte.ac.cn (J.Y.)



**Figure S1.**  $\theta$ - $2\theta$  XRD full scans of ZGO films over MgO showing c-axis-oriented growth which deposited under different conditions of (a) substrate temperature, (b) oxygen pressure and (c) laser fluence.

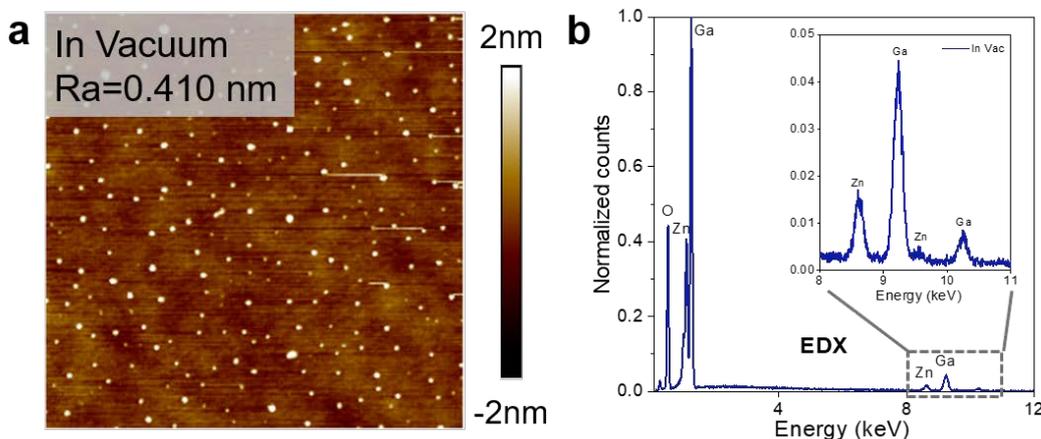
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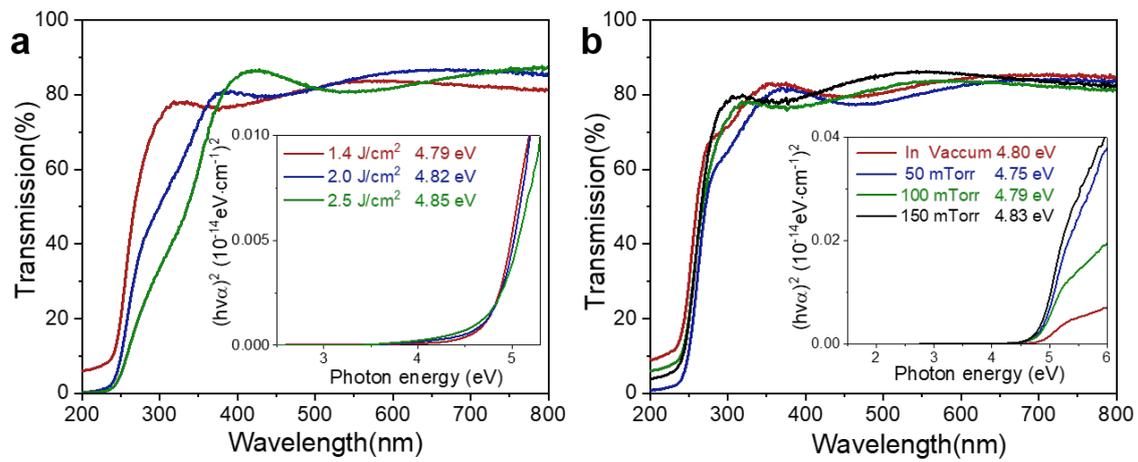
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**Figure S2.** (a) Topology AFM image (scan area of  $2 \times 2 \mu\text{m}^2$ ) of the ZGO films deposited in vacuum ( $\sim 1 \times 10^{-6}$  Pa). (b) EDX spectra image of a Zn-deficient film deposited in vacuum showing Zn/Ga < 1/2 due to Zn volatilization during the film growth.



**Figure S3.** Thin film transmission as a function of excitation wavelength for ZGO films with (a) different laser fluence and (b) different oxygen pressure. Inset shows a linear extrapolation of  $E_g$  for ZGO films from their UV-Visible transmission spectra.