

Special Issue on Study of Defects in the Epitaxial Wide-Bandgap Semiconductor Materials

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The wide-bandgap (WBG) semiconductor, known as the third-generation semiconductor, has made significant progress in recent years driven by the explosive market growth of 5G technique, intelligent networks, and the electric automobile industry. WBG materials have been extensively applied in RF devices, optoelectronics, and power electronics. Compared with traditional semiconductor materials (i.e., Si, GaAs), WBG materials exhibit huge advantages such as high frequency, high temperature capabilities, radiation resistance, and high power operations. With the development of epitaxial techniques, such as chemical vapor deposition (CVD) and molecular beam epitaxy (MBE), a wide range of WBG materials, including SiC, GaN, and AlN, have been grown on various substrates (e.g., Si and sapphire). However, the epitaxy of high-quality WBG films becomes a vital but challenging task in realizing novel or improved WBG-based devices. In this context, scanning techniques such as transmission electron microscopy (TEM), scanning electron microscopy (SEM), and atom probe tomography (APT) are powerful tools in studying the behavior of defects and controlling the defects during the epitaxy.

The objective of this special issue is to publish high-quality research papers presenting original research, as well as review articles, on the studies of defects/dislocations by scanning microscopies. WBG materials include SiC, diamond, (Al)GaN, ZnO, and AlN and their related devices.

Potential topics include but are not limited to the following:

- ▶ Studies focusing on surface morphology, roughness, and surface defect/dislocation density by AFM, SEM
- ▶ Analysis of dislocation formation, propagation, and prevention on various substrates (Si /Sapphire) by high-resolution TEM and APT, and other scanning microscopy techniques
- ▶ Strain relaxation analysis by high-resolution electron microscopy
- ▶ Novel strategies to control dislocation density for high-quality WBG epitaxial films

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/scanning/srdf/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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