

Abstract Submitted
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Crystal orientation control of CdTe epitaxial layers grown on (100) GaAs with ZnSe buffer layer by molecular beam epitaxy¹ QIANG ZHANG, WILLIAM CHARLES, BINGSHENG LI, AIDONG SHEN, CARLOS MERILES, MARIA TAMARGO, The City College of the City University of New York — Based on our previous experience with the growth of ZnSe on GaAs, we have improved the substrate, on which we deposit CdTe by first depositing a ZnSe buffer on the bulk GaAs crystals. This allows us to control the II-VI/III-V heterovalent epitaxy prior to the CdTe deposition. Depending on the control of the interface between ZnSe and CdTe, it was possible to stabilize the growth of either (100) or (111) CdTe epitaxial layers on the (100) ZnSe/GaAs substrate. Reflection high-energy electron diffraction was used to observe the nucleation of the epitaxial layers in situ during the growth, while x-ray diffraction and photoluminescence measurements indicate that the CdTe is of high structural quality despite the large lattice constant mismatch of 14.3% between CdTe and ZnSe. To explore the full impact of controllable-orientation growth technique, optical pumping and time-resolved Faraday rotation experiments were performed on CdTe films grown in different crystal orientation.

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