

Abstract Submitted
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CdTe films grown on Si, GaAs and Quartz substrates¹ Z.X. MA, KIN MAN YU, LBNL, LEI LIU, LBNL, UCB, LAN WANG, DALE PERRY, WLADEK WALUKIEWICZ, LBNL, PETER YU, UCB, LBNL, SAM MAO, LBNL — CdTe films of varying thickness were grown by the laser epitaxy technique on Si(001), GaAs(001), and quartz substrates. The quality of the resultant films was studied by x-ray diffraction and photoreflectance. Splitting of the valence band plus an increase in the band-gap were observed as the CdTe film thickness was decreased. To explain the experimental results, we have examined the contributions from quantum confinement, and from strain induced by the lattice mismatch and by the difference in coefficients of thermal expansion between CdTe and the substrate. For thicker films, we found that the strain was relaxed significantly near the film surface so that its crystalline quality and band-gap approached that of the bulk crystals.

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