Growth of ZnSe/BeTe double-barrier quantum-well heterostructure on vicinal Si (100) surfaces by Molecular Beam Epitaxy

EDUARDO MALDONADO, University of Texas at Arlington, KEVIN CLARK, SHWETA BHANDARU, WILEY KIRK — Growth of ZnSe/BeTe on arsenic passivated vicinal Si (100) substrates is reported with the intention to realize a double-barrier quantum-well structure. Such structures grown on GaAs have been reported by other research groups and showed resonant tunneling at room temperature. In our case, the ZnSe/BeTe structure is grown on silicon via a Zn$_{0.06}$ Be$_{0.94}$ Te buffer layer that is lattice matched to GaAs. The silicon does not play an active role in the RTD behavior; it simply serves as a support layer for the entire structure. Reflection High Energy Electron Diffraction (RHEED) showed an epitaxial growth regime. ¹