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The study of the interface between GaAs substrate and the regrowth GaAs layer formed by MBE and MOCVD

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We study the interface between GaAs substrate and the regrowth GaAs layer formed by MBE and MOCVD. It was found that hole trap levels exist in the MBE regrowth interface, but no trap levels exist in the MOCVD regrowth interface by using DLTS analysis. From SIMS analysis, the carbon impurities of the MOCVD regrowth interface is much lower than that of MBE. MOCVD regrowth can achieve the good regrowth interface characteristics.

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Mobility Model for III-V Compounds Suited for Hydrodynamic Device Simulation

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An improved model for the electron mobility as function of the total electron energy is proposed which is needed in hydrodynamic device simulation. It consists of fit formulas for the individual valley mobilities which are combined by means of the relative valley population Maxwell-Boltzmann distribution. It reflects the situation of intervalley transfer in compounds much better than the models now mostly used and is based on steady-state Monte Carlo calculations. The method can be well applied to III-V alloys, the coefficients being low order polynomials of the material composition.