

Density control of InP/GaInP quantum dots grown by metal-organic vapor-phase epitaxy

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We investigated structural and emission properties of self-organized InP/GaInP quantum dots (QD) grown by metal organic chemical vapor deposition using an amount of deposited In from 7 to 2 monolayers (ML). In the uncapped samples, using atomic force microscopy (AFM), we observed lateral sizes of 100–200 nm, together with a bimodal height distribution having maxima at ~ 5 and ~ 15 nm, which we denoted as QDs of type *A* and *B*, respectively; and reduction of the density of the type-*B* dots from 4.4 to $1.6 \mu\text{m}^{-2}$. The reduction of the density of *B*-type dots were observed also using transmission electron microscopy of the capped samples. Using single dot low-temperature photoluminescence (PL) spectroscopy we demonstrated effects of Wigner localization for the electrons accumulated in these dots.

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