

Abstract Submitted
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One dimensional array of QDs for a single InGaAs layer deposition on a smooth (001) surface of GaAs substrate JOSEPH ABEL, DONG JUN KIM, ADDISON EVERETT, HAEYEON YANG, Utah State University, NANOPHOTONICS TEAM — The formations of quantum dot arrays during the growth of InGaAs/GaAs were reported using multiple layers or high index on the GaAs substrates. The lateral orderings are formed on the capping layer with reduced lateral strain. The other types of arrays were shown by surface diffusion from the substrates at a corrugated surface, such as the edge of terrace. In this study, we directly suggest one-dimensional array on a flat surface of single layer deposition. The sample growth process was performed by molecular beam epitaxy, which connects to a scanning microscope. A $1\mu\text{m}$ thickness buffer was grown at 580°C to get a flat surface. The surface condition was checked by RHEED. $\text{In}_{0.4}\text{Ga}_{0.6}\text{As}$ on GaAs (001) substrate was grown at 500°C with higher arsenic flux than GaAs substrate structure transition amount. The topographic properties of the grown samples were characterized by in-situ STM. Each growth has different InGaAs thickness, from 7.5ML to 6.1ML. In conclusion, we have proposed the new model of InGaAs dot arrays on the GaAs(001) surfaces. Some assumption will be discussed on more experimental results.

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