

Epitaxial films and superlattices by PLD-CCS

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A recently introduced continuous compositional spread (CCS) technique is applied to the synthesis of materials at high temperature and the growth of artificial superlattice structures. The technique is based on pulsed laser deposition (PLD) and the spatially non-uniform deposition rates observed in PLD. Using sequential sub-monolayer deposition of the constituents, alloy formation occurs during the film growth process. Therefore, a pseudo-binary or pseudo-ternary phase diagram is formed at the desired growth conditions and without masks or post-annealing. PLD-CCS has been applied to transparent conducting oxides, ferroelectric films, metastable oxide solid-solutions, and superlattices containing layers with a compositional spread.

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