

## **Role of modulus mismatch on vertically aligned nanocomposite formation during spinodal decomposition in constrained films**

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Self-assembly of oxide film with vertically aligned columnar nanostructure via spinodal decomposition is of potential interest in a range of technique applications. Using three-dimensional phase field simulations of spinodal decomposition of an elastically inhomogeneous cubic binary epilayer, we address how modulus mismatch between the product phases facilitates the columnar structure formation observed in the experiment. A phase diagram is constructed showing the dependence of vertically aligned columnar and laminar structures on the modulus mismatch, cubic anisotropic factor, and anisotropic lattice mismatch.

**Keywords:** Self-assembly, Nanocomposite film, Phase field, Spinodal decomposition