

Modeling of Threading Dislocation Density Reduction in AlN/Al₂O₃ Porous Heterostructure

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Abstract. We analyze the possibility for reducing the density of threading dislocations (TDs) in a porous AlN films exploring numerical calculations of thermoelastic stresses and the reaction-kinetic model of dislocation interactions. We study the distributions of the normal and shear components of the thermoelastic stress tensor in AlN film with triangular pores grown on Al₂O₃ substrate. We find the pore parameters that affect the decrease in the TD density in the AlN film. We compare the results of theoretical calculations with experimental data on TD density reduction in porous AlN/Al₂O₃ heterostructures.

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