Dislocations in nanowire heterostructures: from discrete to continuum

G. Lazzaroni, M. Palombaro, A. Schlömerkemper

Universität Würzburg, Germany

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We discuss an atomistic model for heterogeneous nanowires, allowing for dislocations at the interface. We study the limit as the atomic distance converges to zero, considering simultaneously a dimensional reduction and the passage from the discrete to the continuum. Employing the notion of Gamma-convergence, we establish the minimal energies associated respectively to an elastic (defect-free) configuration and a configuration with dislocations at the interface. This shows under which conditions the dislocations are favoured.