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Models of defects at bi-material interfaces KIPTON BARROS, TURAB LOOKMAN, Los Alamos National Laboratory — Multi-phase composite materials with a high density of bi-material interfaces can exhibit striking strength and robustness in extreme conditions such as shock and radiation damage. Laminar composites of Ag-Cu, Cu-Nb, and Ag-Fe with submicron to nano-scale layer thicknesses have recently been fabricated, but theoretical models of such systems are lacking. The plastic deformation behavior of nano-scale composites is dominated by defects, such as dislocations and twins, that are controlled by the interfaces. We investigate the phenomenology of defect dynamics at bi-material interfaces using Landau theory based models that span atomic and mesoscales.

Kipton Barros
Los Alamos National Laboratory

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