

Abstract Submitted
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Determining the Onset of Amorphization of Crystalline Silicon due to Hypervelocity Impact C. SHANE POLETTI¹, MARTINA E. BACHLECHNER, Fairmont State University — Atomistic simulations were performed to study a hypervelocity impactor striking a silicon/silicon nitride interface with varying silicon substrate thicknesses. Visualization indicates that the crystalline silicon amorphizes upon impact. The objective of the present study is to determine where the boundary between amorphous and crystalline silicon occurs. In the analysis, the silicon substrate is separated into sixty layers and for each layer the average z displacement is determined. Our results show that the boundary between amorphous and crystalline silicon occurs between layers 20 and 22 for an impactor traveling at 5 km/s. This corresponds to a depth of approximately 32 Angstroms into the silicon. More detailed analyses reveals that the z displacement is noticeably larger for the layers that do not have a silicon atom bonded beneath them compared to the ones that do.

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