# Character of Defects at an Ion Irradiated Buried Thin-Film Interface

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## Abstract

The current trend to integrating materials with widely different properties introduces additional interfaces. Ion implantation will continue to place dopants at specific depths, possibly through a number of these interfaces. In this regard, the interface acts as a discontinuity in the system and therefore the production of defects will be expected to be different from that in a bulk crystal. In this work, we report on the nature of defects at the interface produced via ion implantation of 2-MeV $^{28}$Si+ into Si with a buried layer. The properties of the buried layer are varied to understand its influence on interface-defect generation. Using experiments, we show that a large vacancy concentration can be generated at the interface. In addition, simulations using the TRIM Monte-Carlo code show that the nature of the defect can be changed from a vacancy character to interstitial-type depending upon the buried layer properties.

Oak Ridge National Laboratory, managed by UT-Battelle, LLC, for the U.S. Dept. of Energy under contract DE-AC05-00OR22725.

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