

Abstract Submitted
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Single crystal silicon hyperdoped with transition metals DANIEL RECHT, Harvard University, MATTHEW SMITH, JOSEPH SULLIVAN, Massachusetts Institute of Technology, SUPAKIT CHARNVANICHBORIKARN, Australian National University, MARK WINKLER, Massachusetts Institute of Technology, JAMES WILLIAMS, Australian National University, TONIO BUONASSISI, SILVIJA GRADECAK, Massachusetts Institute of Technology, MICHAEL AZIZ, Harvard University — Silicon hyperdoped with sulfur and selenium by ion implantation and pulsed laser melting has recently been shown to undergo an insulator to metal transition. While experimental and theoretical investigations have begun to unravel the nature of this transition, little has been done to generalize this work to other dopants. This talk will discuss recent progress in hyperdoping silicon with transition metal dopants focusing on challenges not present in the silicon-chalcogen system. In particular, experimental results (e.g., SIMS, RBS, TEM) on the role of dopant selection and resolidification velocity in preventing segregation and cellular breakdown of the solidification front will be addressed in detail. In addition, measurements of the optoelectronic properties of silicon hyperdoped with transition metal dopants will be reported.

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