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Ginzburg-Landau simulations of Nb3Sn in large magnetic fields BRAEDON JONES, MARK TRANSTRUM, Brigham Young University — Superconducting resonance cavities are used in particle accelerators to accelerate beams of charged particles to near light speed. The fundamental limit to performance in these cavities is the maximum induced magnetic field that the superconductors can expel. Traditionally, cavities have been made from Niobium; however, current technology has nearly reached the theoretical limit of performance for Niobium-based cavities. To overcome these limitations, Nb3Sn is being explored as a potential next-generation material. In actual development of Nb3Sn cavities, material defects arise that may limit performance. We use time-dependent Ginzburg-Landau simulations to explore which types of defects may be especially detrimental. In this talk, I will focus on small region of excess Sn that have been observed below the surface in real Nb3Sn cavities. I show that these islands may affect performance if they are near the surface, but become irrelevant when they are more than a penetration depth below the interface.

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