

COMPARISON OF DEFORMATION IN HIGH-PURITY SINGLE/LARGE GRAIN AND POLYCRYSTALLINE NIOBIUM SUPERCONDUCTING CAVITIES*

R.E. Ricker, T.H. Gnaeupel-Herold, M.R. Stoudt, NIST
G.R. Myneni, P. Kneisel, TJNAF

Abstract

The current approach for the fabrication of superconducting radio frequency (SRF) cavities is to roll and deep draw sheets of polycrystalline high-purity niobium. Recently, a new technique was developed at Jefferson Laboratory that enables the fabrication of single-crystal high-purity Nb SRF cavities. To better understand the differences between SRF cavities fabricated out of fine-grained polycrystalline sheet in the standard manner and single crystal cavities fabricated by the new technique, two half-cells were produced according to the two different procedures and compared using a variety of analytical techniques including optical microscopy, scanning laser confocal microscopy, profilometry, and X-ray diffraction. Crystallographic orientations, texture, and residual stresses were determined in the samples before and after forming and this poster presents the results of this ongoing study.

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