

# MUON SPIN ROTATION/RELAXATION STUDIES OF NIOBIUM FOR SRF APPLICATIONS

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## *Abstract*

One of the outstanding scientific issues related to superconducting radio frequency cavities made of high-purity bulk niobium is the occurrence of field dependent losses in the walls of the niobium cavity. These losses occur at different RF field levels and pose severe limitations to the niobium technology for both CW or pulsed applications. In this presentation I will explain the results of an experiment which focused on understanding the mechanisms behind losses in the high field regime (above 80-100mT peak magnetic fields). The problem was studied utilizing the unique TRIUMF muon spin rotation (muSR) facility to investigate superconducting properties of niobium samples. In particular, the muon spin rotation experiments aimed at studying the field of first flux entry in high field Q-slope cutouts from small and large grain BCP (buffered chemical polished) 1.5GHz cavities, before and after undergoing 120C UHV-bake. The results obtained will be presented, and it will be discussed in which future direction those results lead.

**CONTRIBUTION NOT  
RECEIVED**