Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Plasma Discharge Effect on Secondary Electron Yield of Various Surface Locations on SRF Cavities MILOS BASOVIC, Old Dominion University, Center for Accelerator Science, ANA SAMOLOV, FILIP CUCKOV, University of Massachusetts Boston, Engineering Department, MILETA TOMOVIC, SVETOZAR POPOVIC, LEPOSAVA VUSKOVIC, Old Dominion University, Center for Accelerator Science — Electron activity (field emission and multipacting) has been identified as the main limiting factor of Superconducting Radiofrequency (SRF) cavity performance. Secondary Electron Yield (SEY) is highly dependent on the state of the cavity's surface, which is investigated before and after plasma exposure. Current methods for simulating the electron activity in SRF cavity consider it as a uniform surface. Due to fabricating procedure there are three distinct areas of the cavity's microstructure: weld zone, heat affected zone, and base metal zone. Each zone has a characteristic microstructure even after the treatments that are currently used to clean the surface of the cavities. Improvement of existing surface treatment techniques, or use of a new is required in order to increase the limit of Q factor towards the theoretical limit of Nb. RF discharge is a promising technique for this purpose. In order to test the effect of the plasma on the SEY of the various cavity surface zones we have developed the experimental setup to measure the energy distribution of the SEY from coupon-like samples. Samples are made in a way that all three zones of cavity surface will be included in the examination. We will present the SEY changes in these three zones before and after plasma treatment.

Milos Basovic
Old Dominion University, Center for Accelerator Science

Date submitted: 17 Jun 2015 Electronic form version 1.4