Contribution ID: **667** Type: **Poster Presentation**

C2Po1A-01 [24]: Effect of mass flow rate on gas propagation after vacuum break in a liquid helium cooled tube.

Tuesday 23 July 2019 09:00 (2 hours)

Vacuum break in particle accelerators is a major concern due to risks associated with personnel and extensive equipment damage. Continuing research in our lab focuses on the sudden loss of vacuum in the liquid helium cooled beam-line tubes of superconducting particle accelerators. In our previous research, we studied nitrogen gas propagation in a uniform tube system immersed in both normal helium (He I) and superfluid helium (He II). It was observed that He II has a stronger effect in slowing down the gas propagation compared to He I, but this effect was identified as largely due to the variation of the point where condensation and deposition of the nitrogen gas on the tube inner wall begins (Int. J. Heat Mass Trans., 129, 1144 (2019)). Here, we discuss our modifications to the tube system that now allow us to accurately control the starting location of gas condensation in both the He I and He II experiments. Systematic studies of gas propagation have been conducted using this new tube system by varying the nitrogen mass flow rate at the tube inlet. Data obtained from these studies are used to expand our current gas propagation theoretical model and for extracting the gas sticking coefficient in the continuum flow region.

Author: GARCEAU, Nathaniel (National Magnetic Field Labortory - FSU)

Co-authors: BAO, Shiran (The National High Magnetic Field Laboratory); Dr GUO, Wei (Florida State University)

Presenter: GARCEAU, Nathaniel (National Magnetic Field Labortory - FSU)

Session Classification: C2Po1A - Applications: Safety and Instrumentation II