

Abstract Submitted  
for the DNP19 Meeting of  
The American Physical Society

**Thermal Analysis and Simulation of the Superconducting Magnet in the SpinQuest Experiment at Fermilab** ZULKALIDA AKBAR, University of Virginia, SPINQUEST COLLABORATION — The SpinQuest experiment at Fermilab aims to measure the Sivers asymmetry for the  $\bar{u}$  and  $\bar{d}$  sea quarks in the nucleon using the Drell-Yan process. The experiment will utilize a target system consisting of a 5T superconducting magnet, transversely polarized  $\text{NH}_3$  and  $\text{ND}_3$  targets, a  $^4\text{He}$  evaporation refrigerator, a 140 GHz microwave source and a large pumping system. The proposed beam intensity is  $1.5 \times 10^{12}$  of 120 GeV proton/sec. A quench simulation in the superconducting magnet is performed to determine the maximum intensity of the proton beam before the magnet transition to the resistive state. A GEANT based simulation is used to calculate the heat deposited in the magnet and the subsequent cooling processes are modeled using the COMSOL Multiphysics.

Zulkaida Akbar  
University of Virginia

Date submitted: 01 Jul 2019

Electronic form version 1.4