

Breese Quinn: Beamline Instrumentation for Muon g-2 and ORKA

With this project, I will make significant contributions to two Intensity Frontier experiments, Muon g-2 and ORKA, primarily in the area of beamline instrumentation. On ORKA, I have taken on responsibility for beamline detector elements including a Cerenkov counter and beam wire chambers. On Muon g-2, I am focusing my efforts on accelerator instrumentation for the secondary beams. By directing my efforts to similar systems on these two experiments, I will maximize the impact I can make on the Intensity Frontier program at Fermilab.

For Muon g-2, I have redesigned, rebuilt, and recommissioned the BNL E821 Cerenkov counter for use in the Fermilab g-2 experiment. This detector will be used to measure the beam species composition of the secondary beams immediately following the target, and just prior to entering the muon storage ring. This Cerenkov counter has been installed in the beamline and is ready for beam tests in March 2014. After the tests have been completed, I will begin work on incorporating instrumentation material into the Muon g-2 beam simulation. For ORKA, I have conducted preliminary cost estimates for a beamline Fitch-style Cerenkov counter, and beam wire chambers similar to those used in BNL E949, but optimized for the ORKA beams and detector at Fermilab. I will move into more detailed R&D for these ORKA systems with this project.