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Fermilab E1039 Radiation Studies to Optimize the Experimental Layout[1] SHANNON MCNEASE, Abilene Christian University, SEAQUEST COLLABORATION — Experiment 1039 at Fermi National Accelerator Lab will use the 120 GeV proton beam from the Main Injector to collide with a polarized target to study the spin structure of the nucleon sea quarks. In particular E1039 will measure the asymmetry in the distribution of the muon pairs produced in the Drell-Yan process. In order to polarize the target of frozen NH3 and ND3 a series of vacuum pumps is needed in the high radiation area near the target. This experiment will use the same spectrometer, beam line, and spill structure as E906 along with same shielding with minor upgrades; therefore measurements made by the Fermilab radiation safety team during SeaQuest run can be used for a radiation study. The measurements of thermoluminescent dosimeter badges, and ion chambers are compared with the MARS simulation of the radiation field in SeaQuest to give the amount of radiation in a particular area outside of the shielding. With these three studies a proposal was made for the best placement of the sensitive electronics that is inside the vacuum pump controller, and to see if more protection is needed. This presentation will cover the process of research and calculations of the radiation study and the proposed best place for the controller electronics.

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