

Abstract Submitted
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Design and Development of a Cryogenic Preamplifier for the MuSun Experiment¹ EISEN GROSS, STANLEY GOSTON, MATTHEW GUBANICH, JEFFREY STROUD, FREDERICK GRAY, Regis University, MUSUN COLLABORATION — The MuSun Collaboration is working to measure the rate of muon capture on the deuteron with high precision. A pad plane TPC filled with cryogenic deuterium gas detects muons and nuclear recoils. In previous experimental runs the preamplifiers for the TPC were located outside its vacuum chamber at a distance of 80 cm. This additional cable added interference, capacitance and noise, which decreased the energy resolution. A design for a preamplifier was developed that could be placed inside the vacuum at low temperatures. Components for the preamplifier were tested and characterized, and a prototype was constructed. Measurements of energy resolution as a function of detector capacitance are in progress, and they will be presented along with the design of the preamplifier.

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