

Abstract Submitted
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Measuring Muon Capture on the Deuteron FREDERICK GRAY, Regis University, MUSUN COLLABORATION — The MuSun experiment will measure the rate of nuclear muon capture on the deuteron with a precision of 1.5%. This rate will be used to fix the low-energy constant that describes the two-nucleon weak axial current in effective field theory models. It will therefore calibrate evaluations of proton-proton fusion and neutrino-deuteron scattering. The experiment uses many of the techniques and much of the apparatus that were developed for the successful MuCap measurement of the rate of muon capture on the proton. However, to optimize the molecular kinetics, the deuterium gas is cooled to 30 K in a cryogenic time project chamber (TPC). In preparation for an upcoming high-statistics production run, a new in-vacuum cryo-preamplifier has been developed to improve the energy resolution of the TPC, and x-ray detectors to monitor the elemental purity of the target gas have been tested. These upgrades will be described, as will the significant progress that has been made in the analysis of data from the initial fall 2011 production run.

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