Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Measuring the Rate of Muon Capture on the Deuteron LUIS IBANEZ, Boston University, MUSUN COLLABORATION — The goal of the MuSun experiment is to 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 projection chamber (TPC). Progress in the analysis of the data taken during the production run of 2011 will be presented, as well as a description of the hardware upgrades and performance during the 2013 run, in preparation for another high-statistics run in 2014.

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Date submitted: 09 Jan 2014 Electronic form version 1.4