

Abstract Submitted
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MuSun - Muon Capture on the Deuteron¹ PETER KAMMEL, Department of Physics, University of Washington, Seattle, MUSUN COLLABORATION — The MuSun experiment is a measurement of the rate for muon capture on the deuteron to 1.5% precision. This basic weak interaction process on a nucleus can be calculated and measured to a high degree of precision. Experimental improvements are due to a novel active target technique, while electro-weak observables in few-body systems can now be calculated within the framework of QCD based effective field theories (EFT). The experiment is designed to resolve the long-standing inconclusive experimental status and to determine an important, but poorly known low-energy constant, required in the EFT. This constant also enters the calculation of fundamental astrophysical reactions, like solar pp fusion and νd scattering. The MuSun experiment will determine it to a precision 5 times greater than presently available from 2N observables. The experiment must be performed under conditions which lead to an unambiguous interpretation, independent of muonic atomic physics complications. A new high-density cryogenic time projection chamber filled with ultra-pure deuterium has been developed as a target and a first production run has been performed. Several upgrades are being prepared towards the collection of the full statistics.

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Peter Kammel
Department of Physics, University of Washington, Seattle

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