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## MuSun: Muon Capture on the Deuteron

*Thursday, 20 October 2022 10:00 (20 minutes)*

The goal of MuSun is a first precise measurement of a weak process in the 2-nucleon (2N) system. These reactions include muon capture on the deuteron,  $\mu + d \rightarrow n + n + \nu$ , together with two astrophysics reactions of fundamental importance, solar pp fusion and  $\nu d$  reactions. The above interactions involve the same, but poorly known axial-vector coupling at a four-nucleon vertex, which also enters in the construction of chiral three-nucleon forces and in other weak and strong dynamics. MuSun plans to determine the strength of this coupling with about 5 times better precision than presently known from the 2N system.

The MuSun employs a novel experimental method to measure muon capture, based on a TPC filled with ultra-pure cryogenic deuterium gas to track the stopping muons from the piE1 beamline at PSI. After collecting the full statistics of  $1.4 \times 10^{10}$  events, the MuSun collaboration concentrated on the analysis of this data. In my talk I will present the experiment and the analysis including the complete experimental error budget before the final unblinding step.

**Presenter:** KAMMEL, Peter (University of Washington, Seattle)

**Session Classification:** Session