Contribution ID: **316** Type: **Invited Talk**

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, $\mu + d \longrightarrow n + n + \nu$, together with two astrophysics reactions of fundamental importance, solar pp fusion and νd 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 1.4x10^10 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.

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Session Classification: Session