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## **MuSun experiment: precision measurement for Muon capture on the deuteron rate**

The goal of the MuSun experiment is to measure the rate of 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 Chiral perturbation theory. It will therefore calibrate evaluations of solar proton-proton fusion and neutrino-deuteron scattering (SNO experiment). MuSun is the part of the systematic program to achieve a new level of precision in confronting the theories of weak interactions, QCD and few body physics, and inherits some of the well developed techniques and apparatus from successful MuCap measurement of the rate for muon capture on the proton. We are using the muon beamline supplied from Paul Scherrer Institute, and our target is the cryogenic time projection chamber (TPC) filled with the deuterium gas at 30K, to optimize the molecular kinetics. Progress of the hardware improvement and data analysis for high statistics run in 2013 will be presented.

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