

Investigating the proton structure with the FAMU experiment at RIKEN-RAL

Friday 19 July 2024 15:45 (15 minutes)

The FAMU experiment (Fisica degli Atomi MUonici), led by INFN at the Rutherford Appleton Laboratory (UK), is designed to measure the hyperfine splitting of the muonic hydrogen ground state. This measurement, aiming to give an accurate insight of the proton's magnetic structure, plays a key role in verifying the most accurate QED calculations and tests the interaction between proton and muon. A 55 MeV/c pulsed negative muon beam is produced by the ISIS synchrotron at the RIKEN-RAL muon facility. The beam is directed against a gaseous hydrogen-oxygen target, where a pulsed Mid-InfraRed laser with a tunable wavelength around 6.8 μm is injected. The aim is to determine the laser wavelength stimulating the resonant spin-flip in μH atoms, which is a function of the proton Zemach radius. The experiment started data taking in 2023, and a new set of data is being taken in 2024-5. In this presentation, the status of the FAMU experiment, its performance and its future development are presented.

Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

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Session Classification: Operation, Performance and Upgrade (incl. HL-LHC) of Present Detectors

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