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Measuring the muonic hydrogen hyperfine splitting with FAMU

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The FAMU experiment aims to measure the hyperfine splitting (HFS) of the muonic hydrogen in the ground state to get insight into the proton magnetic structure. The FAMU is located at RIKEN-RAL muon facility. Here, the muon beam is directed onto a gas target to form muonic hydrogen. Then, a mid-infrared pulsed laser, specifically developed by the collaboration, is injected in the target. The laser wavelength is tuned in a window around $6.8\text{ }\mu\text{m}$ to search for the hyperfine splitting resonance. The X-rays that signal the HFS transition are detected by 34 LaBr₃:Ce detectors; a fibre hodoscope monitors the muon beam profile and is used to estimate the muon current. In 2023, the experiment successfully collected data for the first time using the complete set of equipment. Effective data collecting is still going on in 2024, while the data analysis continues to progress. This contribution will focus on the status of the experiment and the performances during beam time.

Primary author: Dr PIZZOLOTTO, Cecilia

Presenter: Dr PIZZOLOTTO, Cecilia

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