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## The FAMU experiment

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By using the RAL-RIKEN intense pulsed muon beam and an on-purpose developed high-energy mid infrared tunable laser the FAMU experiment will measure the hyperfine splitting in the ground state of muonic hydrogen  $\Delta E_{hfs}(\mu\text{-p})1S$  with a precision  $\delta\lambda/\lambda < 10^{-5}$  providing crucial information on proton structure and muon-nucleon interaction. Specifically FAMU will provide  $r_Z$ , the Zemach radius of the proton with higher precision, than what was previously possible, disentangling discordant theoretical values and will quantify any level of discrepancy that may exist between values of  $r_Z$  as extracted from hydrogen and muonic hydrogen. The aim is to set a cornerstone result about not yet explained anomalies on the charge radius of the proton. The Zemach radius  $r_Z$  and the charge radius  $r_{ch}$  are the only proton shape-related values that can be directly extracted from experimental data, and  $r_Z$  is the only one that gives information about the proton's magnetic dipole moment distribution. The results of the preparatory phase and the present status of the experiment will be presented.

**Presenter:** VACCHI, Andrea

**Session Classification:** Fundamental Symmetries