## PSAS'2018 - International Conference on Precision Physics of Simple Atomic Systems



Contribution ID: 69

Type: oral with proceeding

## Measurement of the proton Zemach radius from the hyperfine splitting in muonic hydrogen atom

Thursday 17 May 2018 11:55 (25 minutes)

The proton is a fundamental constituent of the matter. However, it has a complicated internal structure which is difficult to be fully understood. The internal structure of the proton is described by the electronic and magnetic form factors. The charge radius of the proton is defined by these form factors and has been determined experimentally. In recent years, a significant discrepancy between independent measurements of the proton charge radius was reported. This conflict is known as "proton radius puzzle". Even though various interpretations have been proposed, no definitive solution to the problem has been found yet. In order to shed some light on the puzzle, we proposed a new experiment to determine the proton Zemach radius which is defined as a convolution of the charge distribution with the magnetic moment distribution. The proton Zemach radius can be derived from the hyperfine splitting (HFS) in the muonic hydrogen atom. We aim to perform a laser spectroscopy of the muonic hydrogen HFS with the relative uncertainty of 1 ppm and obtain the proton Zemach radius with 1% precision.

## print service

Author:KANDA, Sohtaro (RIKEN)Presenter:KANDA, Sohtaro (RIKEN)Session Classification:Exotic Atoms