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Type: **Talk**

Laser spectroscopy studies of long-lived pionic helium atoms

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The PiHe collaboration of the Paul Scherrer Institute (PSI) have carried out laser spectroscopy of long-lived three-body pionic helium atoms made of a ^4He nucleus, an electron, and a negative pion. Sub-nanosecond laser pulses excited a transition between a pionic state of principal and orbital angular momentum quantum number combinations $(n, \ell) = (17, 16) \rightarrow (17, 15)$. This may lead to future studies of the properties of pions and other mesons using quantum optics techniques, as well as precision quantum electrodynamics (QED) studies of a boson-boson atomic system. This research is complementary to our experiments on metastable antiprotonic helium atoms carried out by the ASACUSA collaboration of CERN to study the properties of a fundamental hadron-antihadron atom.

[1] M. Hori, A. Sótér, V.I. Korobov, Phys. Rev. A 89, 042515 (2014).

[1] M. Hori, H. Aghai-Khozani, A. Sótér, A. Dax and D. Barna, Nature 581, 37 (2020).

Is this abstract from experiment?

Yes

Name of experiment and experimental site

PiHe and ASACUSA

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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