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[305] Ramsey spectrometer for matter-antimatter experiments

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The ASACUSA collaboration, based at the AD of CERN aims to measure the ground state hyperfine structure of antihydrogen at a ppm level relative precision with a Rabi-type beam experiment [1]. For the same, a spectrometer line has been fully commissioned with studies on hydrogen, with a relative precision of 10^{-9} [3]. This precision can be pushed further by the Ramsey method. Using the existing stripline cavity, the decisive Ramsey fringes near the transition frequency can't be observed, thus demanding the finite element simulations and design of various options for new cavity and transmission lines, which shall be discussed.

[1] A. Mohri and Y. Yamazaki, Europhys. Lett. 63, 207–213 (2003).

[2] M. Diermaier et al., Nat. Commun. 8, 15749 (2017)

Author: NANDA, Amit (Austrian Academy of Sciences (AT))

Presenter: NANDA, Amit (Austrian Academy of Sciences (AT))

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