

Testing the validity of the equivalence principle with antimatter: the AEGIS experiment

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The validity of the Equivalence Principle for antimatter has never been directly experimentally demonstrated. The AEGIS [1] experiment at the CERN accelerator AD has been recently recommend for approval by the CERN scientific committee and it is aiming to perform a direct measurement of the Earth's acceleration g on antihydrogen.

Progresses in the formation of cold antihydrogen and positronium together with that in the field of acceleration and deceleration of Rydberg atoms by using Stark forces have opened the way toward this ambitious goal.

By merging these technologies and including some realistic upgrading, the AEGIS experiment will form a beam of cold antihydrogen and it will use a Moire' deflectometer coupled to a position sensitive detector to obtain the g value.

A description of the project will be given with emphasis on its experimental perspectives and challenges.

[1] AEGIS proposal, CERN-SPSC-2007-017, CERN-SPSC-P-334, Jun 2007