

Weighing the antiproton: precision laser spectroscopy of antiprotonic helium atoms

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Antiprotonic helium is a metastable three-body neutral atom consisting of an antiproton, a helium nucleus and an electron, which we serendipitously discovered some 20 years ago. The antiproton, which normally annihilates within a few picoseconds when injected into matter, can be “stored” in this system for up to several microseconds, and laser spectroscopy is possible within this time window. From the laser transition frequency, the antiproton-to-electron mass ratio can be deduced to high precision. Recent progress at CERN’s antiproton decelerator (AD) will be discussed.

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