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A roadmap for proton-antiproton precision measurements

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Precision measurements of fundamental properties of protons and antiprotons constitute stringent tests of the fundamental interactions. Comparisons of their charge-to-mass ratios and magnetic moments have been used to constrain potential violations of CPT invariance, asymmetric particle-antiparticle dark matter couplings, and antiproton gravitational anomalies.

The BASE collaboration has established or improved these limits in the recent years, and I will report the latest measurement results. Future improvements are challenging and require new experimental techniques to achieve significant progress in the sensitivity to new interactions. Therefore, I will also present our efforts on developing a transportable antiproton trap, and a sympathetic cooling method for protons/antiprotons based on image-current coupling to laser-cooled ions.

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