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Antinucleon-nucleon/nucleus interactions studied with antiprotonic atom X-ray spectroscopy and scattering

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Nucleon-antinucleon interactions have been extensively studied. Recently, it is pointed out that the p-pbar enhancement and X(1835) resonance, observed in the BESIII experiment, may be related to low-energy nucleon-antinucleon interaction. We propose a new experiment of low-energy antineutron-proton scattering, which is free from the Coulomb interaction effect. We also address open questions on antinucleon-nucleus interactions, mainly studied through antiprotonic atom X-ray spectroscopy, and discuss possible experiments, such as X-ray spectroscopy with Transition Edge Sensor and antineutron-nucleus scattering [1].

[1] A. Filippi, H. Fujioka, T. Higuchi, L. Venturelli, https://arxiv.org/abs/2503.06972

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