

Fizički odsjek Prirodoslovno matematičkog fakulteta Sveučilišta u Zagrebu
Bijenička c. 32, HR-10000 Zagreb

Seminar Fizičkog odsjeka

Vrijeme (s.t.)

Mjesto

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predavaonica F08, prizemlje

Experimental study of the nuclear force between antiprotons

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One of the primary goals of nuclear physics is to understand the force between nucleons, which is a necessary step for understanding the structure of nuclei and their interaction. The large body of knowledge of the nuclear force that has been acquired was derived from studies made on either nucleons or nuclei. Although antinuclei up to antihelium-4 have been discovered and their masses measured, little is known directly about the nuclear force between antinucleons. We study antiproton pair correlations in data collected by the STAR experiment at the Relativistic Heavy Ion Collider (RHIC), where gold ions collide with a centre-of-mass energy of 200 GeV per nucleon pair. Antiprotons are abundantly produced in such collisions, making it feasible to study details of the antiproton–antiproton interaction. By applying a technique similar to Hanbury Brown and Twiss interferometry, we show that the nuclear force between two antiprotons is attractive. In addition, we report two key parameters that characterize the corresponding strong interaction: the scattering length and the effective interaction range. The measured parameters are consistent with the corresponding values for proton–proton interactions.

Voditelji seminara FO

Damir Pajić i Ivica Smolić