

Parallel talk

Time-like proton form factor measurement with PANDA

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摘要

The electromagnetic probe is an excellent tool to investigate the structure of the nucleon. The nearly 4π detector PANDA, will allow to make a precise determination of the electromagnetic form factors of the proton in the time-like region with unprecedented precision. In the one-photon exchange approximation, the center of mass unpolarized differential cross section of the reaction $pp \rightarrow e^+e^-$ is a linear combination of the squared moduli of the electric G_E and magnetic G_M proton form factors. The precise measurement of the angular distribution over almost full angular range then directly gives these quantities. At present only two experiments have provided the ratio $R = |G_E|/|G_M|$ but with large statistical uncertainties. It is shown that with strict PID cuts and a kinematic fit, the dominant background, $pp \rightarrow \pi^+\pi^-$, can be suppressed to much less than 1 % of the signal, without affecting the extraction of the ratio R. PANDA will therefore offer a unique opportunity to measure the ratio with a precision ranging from <1% at low q^2 up to 30% for $q^2 = 14$ (GeV/c) 2 .

关键词 [electromagnetic form factors, nuclear structure, FAIR, PANDA](#)

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