

Study of hadron properties at PANDA

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PANDA (anti-Proton ANnihilations at DArmstadt) is a next generation hadron physics experiment to be operated at the future Facility for Antiproton and Ion Research (FAIR) at Darmstadt, Germany. It will use intense cooled antiproton beams with a momentum between 1.5 GeV/c and 15 GeV/c. The PANDA detector is a state-of-the-art internal target detector allowing the detection and identification of neutral and charged particles almost in the whole solid angle.

One of the major goals of the PANDA experiment is the comprehensive study of hadron properties in the annihilation process. The PANDA experiment will provide the unique possibility to measure properties of hadrons precisely, including charmonium, glueballs, and exotic states. Charmonium states with different quantum numbers can be produced directly. PANDA will measure with high precision the parameters of the resonances in formation mode, making use of the excellent momentum resolution $\Delta p/p = 10^{-4} - 10^{-5}$ of the HESR beam.

The PANDA experiment will also give the opportunity to study hyperon production, including spin properties and CP violation in the decays. The production of hyperon pairs in the same event in the annihilation process help to reduce the systematic errors.

Nucleon Structure will be also studied from electromagnetic processes. The determination of the moduli of electric G_E and magnetic G_M form factors in the time-like domain is for example one of the important targets of the PANDA experiment.

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