Studies of Hadron Structure and Dynamics with the PANDA Experiment at FAIR

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The PANDA (antiProton ANihilation in DArmstadt) collaboration at FAIR is a cooperation of more than 400 scientists from 19 countries. Its central goal is the elementary understanding of hadrons using the power of an antiproton beam. The vast difference in mass between the proton and its constituents is a manifestation of the importance of understanding the binding among quarks in the confinement regime. Exotic hadrons with their non- conventional structure, such as multi-quarks, hybrids, and glueballs will reveal uncharted properties of this binding. Proton form-factor measurements, deep virtual Compton scattering and the wide area of quark(-spin) dynamics as well as the behavior of hadrons inside nuclear media are significantly complementary aspects to understand the very nature of hadrons and are vital pieces of the experimental program of PANDA as well. Thus, open and hidden charm, lepton pairs and radiative channels, hidden strangeness and hyperons are commensurable probes to explore the imminent questions among bound states of QCD. The PANDA experiment features a modern multipurpose detector with excellent tracking, calorimetry and particle identification capabilities. Together with the high-quality antiproton beam at HESR, unprecedented annihilation rate, and sophisticated event filtering, it will be ideally suited to deliver decisive contributions to this field.