

Physics with $\bar{\text{P}}\text{ANDA}$ at FAIR

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The $\bar{\text{P}}\text{ANDA}$ (Antiproton annihilations in Darmstadt) experiment at the Facility for Antiproton and Ion Research, FAIR, in Darmstadt, Germany, will address a variety of questions in hadron physics utilizing an antiproton beam of up to 15 GeV/c in momentum. The experiment is designed to work in the charmonium mass region, where recent experimental evidence found a plethora of states that are apparently incompatible with standard quark model interpretations. The detector system of $\bar{\text{P}}\text{ANDA}$ is optimized to meet the challenges of high-resolution spectroscopy of charmonium states of any quantum number in formation and production with very good background suppression. High interaction rates and unprecedented momentum precision will thus facilitate key experiments in hidden and open charm spectroscopy. Furthermore, $\bar{\text{P}}\text{ANDA}$ is designed for copious strangeness production. The hydrogen cluster jet and pellet targets of $\bar{\text{P}}\text{ANDA}$ can be substituted by heavier targets, allowing for the investigation of meson production in nuclei and the interaction of mesons with the nuclear medium. The presentation will discuss the physics prospects of the many facets of the $\bar{\text{P}}\text{ANDA}$ program as well as the status of the experimental equipment.

The design of the detector components of $\bar{\text{P}}\text{ANDA}$, which will consist of a target solenoid and a forward dipole, is well advanced. Prototypes of all detector components have been subjected to beam tests, detectors are being prepared for early physics experiments. A status report on the detector components will be given and the physics reach of the full detector assembly will be underlined with studies in selected benchmark channels.

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