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# PROBING OF XYZ-MESON STRUCTURE USING ANTIPROTON BEAM WITH MOMENTUN UP TO 15 GeV/c

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The spectroscopy of charmonium-like mesons with masses above the DD\bar threshold has been full of surprises and remains poorly understood. The currently most compelling the-oretical descriptions of the mysterious XYZ mesons attributes them to higher lying char-monum states, hybrid structure with a tightly bound cc\bar diquark or a cq(cq')\bar tetraquark core that strongly couples to S-wave DD\bar molecule-like structures. In this picture, the production of a XYZ particle in high energy hadron collisions and its decays into light hadron plus charmonum final states proceed via the core component of the meson, while decays to pairs of open charmed mesons proceed via the DD\bar component. Until now charmonium-like spectroscopy represents a good testing tool for the theories of strong inter-actions, including: QCD in both the perturbative and non-perturbative regimes, LQCD, po-tential models and phenomenological models. The experiments with antiproton-proton annihilation are well suited for a comprehensive spectroscopy program, in particular, to test the structure of XYZ mesons. These states can be produced abundantly, and their properties can be studied in detail. For this purpose an elaborated analysis of the main character-istics of charmonium-like spectrum is given. The recent experimental data from different col-laborations (BaBar, Belle, BES, LHCb) are analyzed. A special attention was given to the re-cently revealed XYZ states. The attempts of their possible interpretation are considered. Some of these states can be interpreted as higher lying charmonium and tetraquarks candidates. Much more data on different decay modes are needed before firmer conclusions can be made. These data can be derived from the experiment using a high quality antiproton beam with momentum up to 15 GeV/c.

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