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Spectroscopy experiment of charmed and multi-strange baryons using hadron beam at the J-PARC hadron facility

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Understanding hadron formation is one of the fundamental goals of hadron physics. It is essential way to investigate the effective degrees of freedom of hadrons such as the quark-quark correlation, namely the diquark correlation. Spectroscopic observations of charmed and multi-strange baryons can provide a unique opportunity to study diquark correlation. Systematic studies of charmed and multi-strange baryons are expected to reveal effective degrees of freedom for describing hadron structures. The hadron experimental facility at J-PARC aims at revealing hadron structures using the world's most intense meson beam. The J-PARC high-intensity and high-momentum beams can provide many opportunities to investigate the structure of hadrons, in which charm and strange quarks play an important role. High-momentum beam line, called the pi20 beam line, is under construction, and the charmed baryon spectroscopy experiment is planned. In the future, the Hadron Experimental Facility are extended to include beam lines with special capabilities. Dedicated high-momentum beam line called the K10 beam line, which can provide separated negative kaon beam up to 10 GeV/c, is planned to be constructed. Hadron beams are an essential tool for studying the excited states of charmed and strange baryons.

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