Electromagnetic Production of Strangeness at Jefferson Lab

Kei Moriya[1]

[1]Arizona State University

The Thomas Jefferson National Accelerator Facility (Jefferson Lab), located in Newport News, Virginia, has conducted experiments using electromagnetic probes for more than 15 years. The intense electron beam provided by the CEBAF accelerator, and secondary photon beams derived from it have allowed for a very broad physics program in nuclear and particle physics. In particular, the CLAS Collaboration has made significant contributions to the world data for hadron production.

Currently Jefferson Lab has started the commissioning of the accelerator for an upgrade that doubles the maximum energy of the CEBAF accelerator to 12 GeV. A new hall, Hall D houses the GlueX detector, which will allow the reconstruction of multi-particle final states with large and uniform acceptance. In Hall B a new CLAS12 detector is under installation and a broad program for physics with electromagnetic probes has been approved.

In this talk, I will give a review and show highlights of how the research program at Jefferson Lab has contributed to the larger worldwide effort to understand hadronic interactions at the GeV scale, with an emphasis on states involving strangeness. The CLAS Collaboration has published results on states of both open and hidden strangeness, and more results are expected in the coming years. Updates on the commissioning of the new detector systems will be given, together with plans for a bold physics program that aims to map out the spectrum of excited hadron states. It is expected that with the 12 GeV upgrade and new detectors, we will have the energy, acceptance, and statistics to investigate the bulk of the region where excited hadronic states are expected to exist. Of special interest is the spectrum of excited strangeness states, for which there has been little new data in recent decades. Emphasis will be put on the search for excited Ξ states, where the GlueX and CLAS12 Collaborations can make a unique contribution.