

Electroproduction of Strangeness on Light Nuclei

Jörg Reinhold^a for the Jefferson Lab E91-016 Collaboration

^a*Department of Physics, Florida International University, Miami, FL 33199, USA*

The study of the production of hadrons containing strange quarks and of nuclei containing strange baryons provides unique information regarding the interactions among baryons in the nuclear medium. In particular, the electroproduction of Kaons on nucleons and light nuclei is of fundamental importance in elucidating the elementary processes involved. Investigations of electroproduction of strange hadrons at energies near threshold, however, have not been reported. This has been the focus of experiment E91016, recently conducted at Jefferson Laboratory.

The experiment has studied the electroproduction of kaons $A(e,e'K^+)$ on targets of liquid H, D, ^3He and ^4He as well as on C and Al. The ejectiles, e' and K^+ , were detected in coincidence by the HMS and SOS detector systems, respectively, located in experimental Hall C of Jefferson Laboratory. For a given final state or fixed missing mass, a broad angular range was covered. The variety of nuclear targets involved allows for a study of questions regarding the dependences on both mass number and nuclear density for the elementary processes involving strange hadrons. In particular, the measurements on helium targets are the first ever performed.

Preliminary missing mass spectra for the various targets will be shown. The differential cross section and its angular and energy dependences for quasifree production of Λ and Σ hyperons on the various target nuclei will be presented. On the helium targets, the known $^3,4_{\Lambda}H$ bound states have been observed for the first time in electroproduction. Angular distributions for the excitation of these states will be presented.

Work supported in part by the Department of Energy, under contract W-31-109-ENG-38 and DE-AC05-84ER40150.