1. The MEGA Collaboration consists of the following member institutions: UCLA, University of Chicago, Fermilab, Hampton University, University of Houston, Indiana University, Los Alamos National Laboratory, Queens University, Stanford University, Texas A&M University, University of Virginia, Virginia Polytechnical Inst. and State University, University of Wyoming, and Yale University.
2. J.J. Szymanski, *et al.*, in *Proc. of the 5th Conf. on the Intersections of Particle and Nuclear Physics,* St. Petersburg, Florida, June 1994.
3. Y.K. Chen, M.D. Cooper, P.S. Cooper, M. Dzemidzic, C.A. Gagliardi, G.E. Hogan, E.V. Hungerford, G.J. Kim, J.E. Knott, K.J. Lan, F. Liu, B.W. Mayes, R.E. Mischke, R. Phelps, L.S. Pinsky, K.M. Stantz, J.J. Szymanski, L.G. Tang, R.E. Tribble, X.L. Tu, L.A. Van Ausdeln, W. Von Witsch and C.S. Wright, submitted to Nucl. Instrum. & Methods, 1995.

A SEARCH FOR THE H PARTICLE (BNL EXPTS. E813/836)

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The goal of this experiment is to search for a strangeness -2 dibaryon called the H particle. This state was predicted by Jaffe to have a mass 80 MeV less than the $\Lambda\Lambda$ mass of 2232 MeV.[1] The experimental observation of this state would provide much needed data to help understand the confinement mechanism of quarks. The apparatus and experimental technique were presented in a previous progress report[2] and will not be repeated here.

The main IUCF contribution to this project was originally the second-level trigger system, which separates protons from K^+ particles using time-of-flight. The second-level trigger has since been moved to a VME-based 68030 processor for the 1993 data-taking run, and IUCF is no longer responsible for maintaining this system.

For the 1993 data-taking run, IUCF contributed detectors and second-level trigger electronics to the experiment. For the 1994 and 1995 runs, IUCF contributed to the setup and monitoring of the experiment for data-taking.

The 1992 and 1993 data sets have been reduced and neutron energy spectra have been produced. In this experiment, the reactions $K^-p \rightarrow K^+\Xi^-$ and $\Xi^-d \rightarrow H\ n$ are used to produce and tag the H particle. If the H particle exists, there will be a peak in the neutron energy spectrum. We now have an integrated flux of 8×10^{12} K^- particles on target, which was our original goal. The experiment is now sensitive to H particles with a relatively large branching ratio from the Ξ^-d atom. Data analysis is complete for the 1993 data, and a publication is in preparation.

The experiment received more beam time during May, June and July, 1994, which was used primarily for a complementary version of the H search that involves a ^{3}He target and the reaction $K^-\ ^3He \rightarrow K^+H\ n$.

In 1995, the Brookhaven AGS started just after 00:00 on January 1 and is continuing to run through June. Approximately 6 weeks of beamtime were devoted to Si detector-calibration studies using the $\pi^- p \rightarrow K^+ \Sigma^-$, where the Σ^- emulates the Ξ^- in its stopping characteristics. The Σ^- is produced in a liquid hydrogen target. After passing through a tungsten degrader, the Σ^- subsequently captures in a second liquid hydrogen vessel. The Σ^- will then decay via $\Sigma^- p \rightarrow \Lambda n$. The outgoing neutron has 40 MeV, and is detected in one of the neutron detector arrays. This was an important measurement because it demonstrates that the apparatus is capable of producing a hyperon, stopping the hyperon, and observing the decay products of the hyperon in the neutron detector arrays.

After the Σ^- calibration data were taken, additional production data for the H search were taken. An integrated flux of 10^{12} K^- is the goal for the remainder of the 1995 running.

1. R.L. Jaffe, Phys. Rev. Lett. **38**, 195 (1977); ibid., **38**, 617 (1977).
2. IUCF Sci. and Tech. Rep. May 1990 – April 1991, p. 86.