

detectors and neutron detectors. We have a sample of  $K^- + p \rightarrow K^+ + \Xi^-$  events, which allow us to further develop the identification techniques for these events. We have verified that, indeed, protons are the dominant positively-charged particles in our  $K^+$  spectrometer. This means the second-level trigger is very important, and will be used in the 1992 run. Several additional cuts have been devised for this trigger, based on experience gained from the 1991 data. One example is a cut that accepts only large angles when the particle passed through the beam-irradiated region of the first portion of the  $K^+$  spectrometer. This cut preserves kaon efficiency without increasing the number of beam particles in the trigger.

The H-particle search is using a new 2 GeV/c beamline at the BNL AGS. This beamline clearly can be used for other experiments. The E-813/836 collaboration has submitted a proposal to observe the formation of  ${}^6\text{He}$  hypernuclei. There is the possibility of doing weak decay measurements on double- $\Lambda$  hypernuclei. Other experiments are also being explored for the H search apparatus. In addition, during the heavy ion running at the AGS in spring, 1992, the E-886 collaboration did an experiment to study the suitability of the H-search apparatus for searches for strangelets (nuclei with large strangeness quantum number, and very small charge-to-mass ratio).

E-813 will take data during May-July 1992. With approval from the AGS program advisory committee, data taking will continue during 1993 as well.

1. R.L Jaffe, Phys. Rev. Lett. **38** (1977) 195 and 617.

## MEGA: A SEARCH FOR THE DECAY $\mu^+ \rightarrow e^+ \gamma$

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The IUCF contribution to the MEGA experiment (LAMPF experiment 969)<sup>1</sup> consists of major portions of the first- and second-level trigger systems, and responsibility for integrating the parts of the trigger system into the overall experiment. The detector and trigger systems were described in a previous annual report, and this description will not be repeated here. The specific IUCF hardware responsibilities are: the design, fabrication and testing of the routing box and the the design, fabrication, and testing of the trigger fan out/busy (TF/B) modules.

We have finished the remaining two types of TF/B modules needed for the complete MEGA trigger system. Four of the pTF/B (photon TF/B) modules are complete and one unit of the eoTF/B (even/odd electron scintillator TF/B) is complete. These modules are now installed in the MEGA experiment, and no more are needed to accommodate the third and final photon spectrometer, which will be installed in early 1993.

The routing box is a complicated, large electronic module, containing 25 programmable logic array's, 123 1003xx-series ECL chips and hundreds of other connectors, resistors, capacitors, etc., all mounted on a 15.5"  $\times$  19.5" circuit board. The design and component procurement for the routing box was completed in January, 1992. Because of the high chip density and high-speed logic used in this design, it was decided to buy a circuit board built using multiwire technology. Our responsibility was to do the logic design, produce a net list and provide a component layout. The board company (Circuitech of Eatontown, NJ won the bid) then did the routing of the wires and fabrication of the board. The production of the net list required the development of a special FORTRAN program, because the ECL logic family being used in this design requires that wire nets begin at a specific source and follow a single path to a termination resistor. Significant intelligence needed to be built into this program, because the program placed the resistor SIP packages, found the source for each net, decided the ordering of the intermediate points in the net, and terminated the net at the nearest available terminating resistor. The board arrived on April 23 and was quickly stuffed and assembled by the Computer and Electronics group. The routing box was tested, shipped, and installed in the MEGA experiment, where it commenced taking cosmic ray data on May 21.

With the completion of the IUCF hardware obligations, our group has been moving into the installation, testing and maintenance of the third-level trigger system, which consists of filter codes running in a workstation farm. We will need more computing power for the third-level trigger, as we improve the detector acceptance, increase the beam rate and improve the filter codes. For this reason, we have submitted a proposal to the NSF for funding to purchase workstations to be used in the MEGA data-taking in 1993 and beyond.

1. The MEGA Collaboration consists of the following member institutions: UCLA, U. of Chicago, Fermilab, U. of Houston, Indiana U., Princeton, Los Alamos National Laboratory, Stanford U., Texas A & M U., Valparaiso U., U. of Virginia, VPI, U. of Wyoming, and Yale U.
2. R.D. Bolton, *et al.*, Phys. Rev. **D38**, 2077 (1988).
3. See, for example, J.D. Vergados, Phys. Reports, **133**, 96 (1986).