The polarization in our last run was only 13%, and work is continuing to improve the polarization. In particular, new sources have been fabricated and measurements using an X-ray fluoresence spectrometer and an electron microscope have been made to determine the crystal properties of the sources.

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A MEASUREMENT OF PARITY-VIOLATING NEUTRON TRANSMISSION IN XENON

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A series of measurements of parity violating neutron transmission asymmetries in heavy nuclei carried out by the TRIPLE collaboration have demonstrated a number of cases of large amplifications of parity violating effects.[1] We are preparing an experiment to measure the parity violating asymmetry in polarized neutron transmission through xenon. There are two separate motivations for carrying out such a measurement. First, such a measurement would be a useful addition to understanding the A-dependence of the effect.

In addition, recent studies have shown very long relaxation times in polarized solid xenon.[2] If xenon is shown to exhibit large parity violating effects, then a polarized xenon target could be an attractive target in which to search for time reversal violating effects.

The Indiana group is responsible for constructing the xenon target. The target will consist of 1 kg of liquid xenon of natural isotopic abundance immersed in a 120 g holding field for maintaining the neutron polarization. Target design is nearing completion, and tests of the target will begin in the summer of 1994. The experiment is projected to run at LANCSE in 1995.

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

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We continue to play a major role in the MEGA rare muon-decay experiment at LAMPF. The experiment is now in production, with runs having taken place or scheduled during the summers of 1992-1994. We now have sufficient data that, after a complete analysis, the sensitivity of the MEGA experiment to the decay mode $\mu \rightarrow e\gamma$ is a factor of 12-15 better than the existing best measurement. We have also taken data to improve the measurement of the muon decay parameter ρ by a factor of three or better. The new world-best measurement of $\mu \rightarrow e\gamma$ is the thesis project of IU student Keith Stantz.

In previous years, the IUCF group has built substantial portions of the hardware for the first- and second-level trigger systems. The hardware was installed in spring, 1992 and has run for the last two years with few problems. Our group has the responsibility to install, debug and maintain the entire hardware trigger system. One of us (KMS) has also had a leadership role in the installation and commissioning of the electron spectrometer multiwire proportional chambers (MWPCs). These chambers, as discussed below, are truly state-of-the-art in terms of their rate capability and their low mass (3×10^{-4} radiation lengths). (Note that in this report we use the word electron to represent e^+ or e^-). Our final hardware responsibility was to diagnose problems in the (more than 130) FASTBUS modules, and to calibrate the FASTBUS TDC modules.

During 1993, we received funding from The Foundation to upgrade the computing power of the MEGA workstation farm. The workstation farm provides the third-level (software) trigger for the experiment. We purchased upgrades to six existing DECstation 5000-200 workstations, as well as purchasing one new DECstation 5000-240 and memory upgrades to the DECstations and the VAX-station used for data logging. The workstation