Abstract Submitted
for the APR08 Meeting of
The American Physical Society

An upper limit on the electron-neutrino flux from the HiRes detector LAUREN SCOTT, Rutgers, the State University of New Jersey, HIGH RESOLUTION FLY'S EYE COLLABORATION — Air-fluorescence detectors such as the High Resolution Fly's Eye (HiRes) detector are very sensitive to upward-going, Earth-skimming ultrahigh energy electron-neutrino-induced showers. This is due to the relatively large interaction cross sections of these high-energy neutrinos and to the Landau-Pomeranchuk-Migdal (LPM) effect. The LPM effect causes a significant decrease in the cross sections for bremsstrahlung and pair production, allowing charged-current electron-neutrino-induced showers occurring deep in the Earth's crust to be detectable as they exit the Earth into the atmosphere. A search for upward-going neutrino-induced showers in the HiRes-II monocular dataset has yielded a null result. From an LPM calculation of the energy spectrum of charged particles as a function of primary energy and depth for electron-induced showers in rock, we calculate the shape of the resulting profile of these showers in air. We describe a full detector Monte Carlo simulation to determine the detector response to upward-going electron-neutrino-induced cascades and present an upper limit on the flux of electron-neutrinos.

Lauren Scott
Rutgers, the State University of New Jersey

Date submitted: 11 Jan 2008 Electronic form version 1.4