Abstract Submitted
for the APR06 Meeting of
The American Physical Society

Searching for high energy cosmic ray electrons using the Earth's magnetic field. S. NUTTER, Northern Kentucky University, C. BOWER, Indiana University, S. COUTU, Pennsylvania State University, M. DUVERNOIS, University of Minnesota, A. MARTELL, D. MULLER, University of Chicago, J. MUSSER, Indiana University, M. SCHUBNELL, G. TARLE, A. YAGI, University of Michigan — The Cosmic Ray Electron Synchrotron Telescope (CREST) instrument is a balloon payload designed to measure the flux of primary cosmic ray electrons at energies greater than 2 TeV. Because electrons at these energies lose energy rapidly during propagation through the interstellar medium, their detection would indicate the existence of sources which are within a few kiloparsecs. In order to obtain the needed large exposure time and aperture of the detector, we use an approach that depends on the detection of synchrotron photons emitted when the electrons travel through the earth's magnetic field. Such photons have energies in the x-ray and gamma-ray region, hence CREST incorporates an array of inorganic scintillators. Since the primary electrons do not need to pass through the detector, the effective detection area is much larger than the actual detector array size. To verify the technique and to determine background count rates, a prototype array of BGO and BaF2 crystals was flown on high altitude balloon from Ft. Sumner, N.M. in autumn 2005. The full detector system is currently under construction. It will consist of a 1600 crystal array, and will be carried on Long-Duration Balloons on circumpolar trajectory.

S. Nutter
Northern Kentucky University

Date submitted: 12 Jan 2006 Electronic form version 1.4