Abstract Submitted for the APR08 Meeting of The American Physical Society

Charged Particle Astronomy with the Pierre Auger Observatory PATRICK YOUNK, University of Utah, PIERRE AUGER COLLABORATION — The Pierre Auger Collaboration has recently discovered a significant correlation between the arrival directions of the highest energy cosmic rays and the positions of relatively nearby active galactic nuclei (AGN). We have demonstrated that the cosmic ray flux at the highest energies is anisotropic with a confidence level greater than 99% using an independent data set with the test parameters specified a priori, chosen from the results of an exploratory scan. We conclude that the observed anisotropy is consistent with the hypothesis that cosmic rays with the highest energies originate from extragalactic sources close enough so that their flux is not significantly attenuated by interactions with the cosmic background radiation (the Greisen-Zatsepin-Kuzmin Effect). Our present data set does not unambiguously identify the sources as nearby AGN, however we demonstrate that the AGN source hypothesis is compatible with the data. In this presentation, I review these findings and discuss the prospect of charged particle astronomy, the identification and measurement of individual cosmic rays sources, within the next several years.

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Date submitted: 09 Jan 2008

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