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**Two Point Autocorrelation Analysis of Auger Highest Energy Events Backtracked in Galactic Magnetic Field** YEVGENIY PETROV, Colorado State University, PIERRE AUGER COLLABORATION — Searches for sources of the highest-energy cosmic rays traditionally have included looking for clusters of event arrival directions on the sky. The smallest cluster is a pair of events falling within some angular window. In contrast to the standard two point (2-pt) autocorrelation analysis, this work takes into account influence of the galactic magnetic field (GMF). The highest energy events, those above 50EeV, collected by the surface detector of the Pierre Auger Observatory between January 1, 2004 and May 31, 2009 are used in the analysis. Having assumed protons as primaries, events are backtracked through BSS_S, BSS_A, ASS_S and ASS_A versions of Harari-Mollerach-Roulet (HMR) model of the GMF. For each version of the model, a 2-pt autocorrelation analysis is applied to the backtracked events and to $10^5$ isotropic Monte Carlo realizations weighted by the Auger exposure. Scans in energy, separation angular window and different model parameters reveal clustering at different angular scales. Small angle clustering at 2-3 deg is particularly interesting and it is compared between different field scenarios. The strength of the autocorrelation signal at those angular scales differs between BSS and ASS versions of the HMR model. The BSS versions of the model tend to defocus protons as they arrive to Earth whereas for the ASS, in contrary, it is more likely to focus them.

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