

Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Geant4 Simulation of Air Showers using Thinning Method¹ MOHAMMAD S. SABRA, NASA Postdoctoral Program Fellow, NASA Marshall Space Flight Center, JOHN W. WATTS, University of Alabama Huntsville, MARK J. CHRISTL, NASA Marshall Space Flight Center — Simulation of complete air showers induced by cosmic ray particles becomes prohibitive at extreme energies due to the large number of secondary particles. Computing time of such simulations roughly scales with the energy of the primary cosmic ray particle, and becomes excessively large. To mitigate the problem, only small fraction of particles can be tracked and, then, the whole shower is reconstructed based on this sample. This method is called Thinning. Using this method in Geant4, we have simulated proton and iron air showers at extreme energies ($E > 10^{16}$ eV). Secondary particle densities are calculated and compared with the standard simulation program in this field, CORSIKA.

¹This work is supported by the NASA Postdoctoral Program administrated by Oak Ridge Associated Universities

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Date submitted: 09 Jan 2015

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