



Contribution ID: 82

Type: poster

Ultra-High-Energy Cosmic-Ray Outburst from GRB 221009A

We study accelerations, energy loss and the escape of cosmic rays in GRB 221009A, and suggest that GRB 221009A is an ultra-high-energy(UHE) cosmic ray source with ability of accelerating protons to $> 10^{20}$ eV. It is difficult for UHE protons to escape from the source and the host galaxy, while neutrons at the energies of tens of EeV, produced in the process of $p + \gamma \rightarrow n + \pi^+$, are able to escape from the source as well as the host galaxy without suffering from the serious magnetic field deflection and then decay into protons in the inter-galactic space. After entering the Milky Way, protons will be deflected by the Galactic magnetic field, and will arrive at Earth with a time delay. We make predictions on the possible future observation on the UHECRs from GRB 221009A by cosmic ray detectors, such as PAO, TA \times 4 and GRAND.

Summary

Primary authors: Dr ZHANG, Bing Theodore (YITP); HE, Hao-Ning (Purple Mountain Observatory); Dr FAN, Yi-Zhong (PMO)

Presenter: HE, Hao-Ning (Purple Mountain Observatory)