Contribution ID: 65

Type: Original Talk

Carpet-3 detection of a photon-like air shower with estimated primary energy above 100 TeV in a spatial and temporal coincidence with GRB 221009A

The brightest cosmic gamma-ray burst (GRB) ever detected, GRB²221009A, was accompanied by photons of very high energies. These gamma rays may be used to test both the astrophysical models of the burst and our understanding of long-distance propagation of energetic photons, including potential new-physics effects. Here we present the observation of a photon-like air shower with the estimated primary energy of 300^{+43}_{-38} TeV, coincident (with the chance probability of $\sim 9 \cdot 10^{-3}$) with the GRB in its arrival direction and time. Making use of the upgraded Carpet-3 muon detector and new machine learning analysis, we estimate the probability that the primary was hadronic as $\sim 3 \cdot 10^{-4}$. This is the highest-energy event possibly associated with any GRB.

Primary authors: KARPIKOV, Ivan (INR RAS); CARPET-3 COLLABORATION

Presenter: KARPIKOV, Ivan (INR RAS)

Session Classification: Cosmic rays (nuclei, gammas, neutrinos) of very high energies (> 100 TeV)

Track Classification: Cosmic rays (nuclei, gammas, neutrinos) of very high energies (> 100 TeV)