Contribution ID: **5** Type: **not specified**

ALPACA Project : 100 TeV Gamma-ray Observation in the Southern Sky

Thursday, 10 November 2016 16:30 (30 minutes)

We are now proposing a new project to observe 10-1000 TeV gamma rays with very low background noise and wide field of view in the southern hemisphere. We call the ALPACA (Andes Large area PArticle Detector for Cosmic ray physics and Astronomy) project. The observatory will consist of 83,000 m^2 air shower array and 5,400 m^2 underground water-Cherenkov-type muon detector array constructed at 4,740 m a.s.l. (mountainside of Mt. Chacaltaya), near La Paz in Bolivia. The gamma-ray induced air shower has much less muons compared with a cosmic-ray induced one. Therefore, the cosmic-ray backgrounds will be significantly discriminated from the gamma-ray signals by means of counting the number of muons in an air shower. With the ALPACA project, we expect to detect gamma rays between 10 and a few hundred TeV from the Galactic Center if cosmic rays are accelerated up to PeV energies at the supermassive black hole as suggested from the recent H.E.S.S. observation. In this talk, we will introduce the present status and the future plans of our project.

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Session Classification: Future Detectors

Track Classification: Site