HAP Workshop Topic 4, Advanced Technologies



Contribution ID: 4

Type: not specified

The HiSCORE concept and project status

Monday 2 June 2014 15:05 (20 minutes)

The HiSCORE concept is an air shower front sampling experiment based on non-imaging wide angle air Cherenkov detectors, each with a light collection area of the order of 0.5 m[^]2, and distributed over a large area of 1-100 km[^]2. The large field of view of 0.6 sr allows to cover pi sr of the sky for more than 200 hours per year. The Cherenkov pulse amplitudes and their timing provides a measurement of the lateral and longitudinal developement of the air shower and allows to reconstruct the energy, direction and type of the primary cosmic particle. HiSCORE will allow gamma-ray surveys beyond 10 TeV primary energy and cosmic ray physics from 100 TeV to 1 EeV. The main goal of HiSCORE is to find the Galactic cosmic ray Pevatrons by the detection of their gamma-ray spectra, expected to extend up to several hundreds of TeV. Furthermore, HiSCORE will cover cosmic ray measurements in the transition range from a supposed Galactic to an extragalactic origin of cosmic rays.

At least one solution exists for each detector component. After a first prototype stage with 3 detector stations, the Tunka-HiSCORE collaboration has deployed a 9-station array covering an area of 0.1 km² in the Tunka valley in Siberia. This array is operating since October 2013 and is currently used to test the different detector components, the DAQ, and the reconstruction and analysis software. Starting in autumn 2014, an extension of 25 stations is planned. Recently, the TAIGA collaboration was founded, aiming at the construction of a large array of HiSCORE stations in combination with small (~3m) imaging atmospheric Cherenkov telescopes. A further prototype based on partly different detector components is currently in a testing stage. An array of 5 detector stations based on this latter design is planned for deployment on the site of the Pierre Auger Observatory in 2015.

Primary author: Dr TLUCZYKONT, Martin (University of Hamburg)Presenter: Dr TLUCZYKONT, Martin (University of Hamburg)Session Classification: Session 1