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Astroparticle and Particle Physics with HiSCORE

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We propose to explore the cosmic ray and gamma-ray sky (accelerator sky) in the so far poorly covered energy range from 10 TeV to 1 EeV.

The main motivation for observations in this energy regime is to solve the origin of Galactic cosmic rays. Further different questions of astroparticle and particle physics could be addressed in this energy regime.

Furthermore, new physics questions might arise by opening the last remaining observation window of gamma-ray astronomy (TeV/PeV).

The proposed large-area (100 square-km) wide-angle (0.9 sr) air Cherenkov detector HiSCORE (Hundred Square-km Cosmic ORigin Explorer) is based on non-imaging Cherenkov light-front sampling with sensitive large-area detector modules of the order of 0.5 square-m. Sampling the lateral photon density and arrival-time distribution allows the reconstruction of the direction,

the energy and the particle type (mainly shower depth) of the primary particle.

The physics motivations, the detector concept, the expected performance and the current status of the experiment will be presented.

Primary author: Dr TLUCZYKONT, Martin (University of Hamburg)

Co-authors: Mr HAMPF, Daniel (University of Hamburg); Prof. HORNS, Dieter (University of Hamburg); NACHTIGALL, Rayk (University of Hamburg); EICHLER, Robert (University of Hamburg); Mr KNEISKE, Tanja (University of Hamburg)

Presenter: Dr TLUCZYKONT, Martin (University of Hamburg)

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