

SciNeGHE 2016 High-energy gamma-ray experiments at the dawn of gravitational wave astronomy



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Current status and recent results from H.E.S.S.

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The High Energy Stereoscopic System (H.E.S.S.) is an array of Imaging Atmospheric Cherenkov Telescopes (IACTs) located in the Khomas Highland of Namibia. The array initially consisted of four 12 m telescopes, operating as a single stereoscopic system. A decade of H.E.S.S. observations yielded a vast array of discoveries which now form the heritage of the very-high-energy (VHE) gamma-ray astronomy. This includes the H.E.S.S. Galactic Plane Survey, which provided a systematic scan of the Galactic disk with a $\sim 2\%$ Crab Nebula point-source sensitivity and a ~ 0.1 deg angular resolution, spectral and morphological studies of Supernova Remnants, Pulsar Wind Nebulae, observations of fast variability in blazars, gamma-ray binaries, constraints on the Extragalactic Background Light, and other important results. In 2012, a fifth telescope, with a 28 m mirror, was added in the center of the array, marking the start of H.E.S.S. Phase II. The new telescope, dubbed CT5, potentially extends the energy range covered by H.E.S.S. down to ~ 30 GeV. Such an extension of the instrument's energy range is particularly beneficial for studies of transient phenomena and variable sources with soft spectra, such as Gamma-Ray Bursts (GRBs) and Active Galactic Nuclei (AGNs) located at high redshifts (> 0.5), as well as gamma-ray pulsars. The cameras of the 12 m telescopes are currently being upgraded to improve the data taking efficiency and optimize the array performance at low energies. We will present the current status of H.E.S.S. and its recent results, including the H.E.S.S. II observations of the Vela pulsar and several AGNs, as well as the famous discovery of the Galactic Centre "Pevatron", observations of the Large Magellanic Cloud, and new VHE source discoveries from the H.E.S.S. Galactic Plane Survey. We will also discuss the potential of H.E.S.S. to detect possible gamma-ray counterparts of gravitational waves.

Primary author: ZABOROV, Dmitry (LLR - Ecole Polytechnique)

Presenter: ZABOROV, Dmitry (LLR - Ecole Polytechnique)

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