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Cherenkov Detector Arrays in LHAASO and Updated Physics Results

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LHAASO using large area water Cherenkov for CR air shower detection in the energy range from 0.5 to 20 TeV for gamma ray astronomic observation of mainly extragalactic objects. The water cherenkov detectors are burried 2.5 m beneath the surface to measure muons in showers in LHAASO. The largest muon detector array with the active area of 40k square meters in the CR detction history provides most powerful supression of CR background in detection of gamma rays at energies above 10 TeV up to 10 PeV. This permits discovery of many PeVatrons widely existing in the Milky Way. In LHAASO 18 imaging air Cherenkov telespoces used to measure shower developments for both shower energy and shower maximum, which allow the attempts of identification of protons, helium and even iron nuclei at energies above 0.1 PeV up to 100 PeV in which the knees of individual species spectra are expected. Now, the proton and helium spectra are measured with high purity samples.

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