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Astrophysics Motivation behind the Pierre Auger Southern Observatory Enhancements

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Abstract content

The Pierre Auger Collaboration intends to extend the energy range of its southern observatory in Argentina for high quality data from 0.1 to 3 EeV. The extensions proposed and described in accompanying papers, include three additional fluorescence telescopes with a more elevated field of view (HEAT) and a nested surface array with 750 and 433 m spacing respectively and additional muon detection capabilities (AMIGA). The enhancement of the detector will allow measurement of cosmic rays, using the same techniques, from below the second knee up to the highest energies observed. The evolution of the spectrum through the second knee and ankle, and corresponding predicted changes in composition, are crucial to the understanding the end of Galactic confinement and the effects of propagation on the lower energy portion of the extragalactic flux. The latter is strongly related to the cosmological distribution of sources and to the composition of the injected spectrum. We discuss the science motivation behind these enhancements as well as the impact of combined HEAT and AMIGA information on the assessment of shower simulations and reconstruction techniques.

If this papers is presented for a collaboration, please specify the collaboration

The Pierre Auger Collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 5 (HE part 2), pages 1101-1104

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