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## The Pierre Auger Observatory Enhancements

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The Pierre Auger Observatory was designed to study the extensive air showers generated by Ultra High Energy Cosmic Rays (UHECRs). It consists of 1600 water Cherenkov detectors spread over 3000 km<sup>2</sup> viewed by 24 fluorescence telescopes. The implementation of these two complementary techniques together is known as the hybrid detection and makes Auger unique. The combination of a large ground array and fluorescence detectors allows the reconstruction of the shower axis geometry with greater accuracy than the achieved with either detector system on its own. The Southern site of the Observatory is acquiring data since 2004 and its construction was completed in mid 2008.

Enhancements to this baseline configuration are currently being made to decrease the minimum energy to an order of magnitude below its original design. This includes three additional telescopes with elevated field of view (HEAT, High Elevation Auger Telescopes) and a nested surface array with 750 m and 433 m spacing respectively and additional muon detection capabilities (AMIGA, Auger Muons and Infill for the Ground Array). HEAT is fully commissioned and is taking data continuously since September 2009. The status and prospects of HEAT are discussed. AMIGA is in a very advanced stage with most of the infill detectors installed and taking data since August 2008 and with the first muon detector prototype installed. We present the status of AMIGA and the performance of the surface infill array.

The Southern Auger Observatory provides an excellent test bed to study alternative ways for detection of extensive air showers. In particular several efforts are being done in radio detection in the VHF band as well as through a novel detection technique using the microwave emission from the electromagnetic cascade induced in the atmosphere by the UHECRs.

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