A Direct Cerenkov Observatory for High-Energy Cosmic Rays

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Abstract: A design concept for a future ground-based cosmic-ray observatory using the Direct Cerenkov technique will be presented. This technique can provide high precision, largely model-independent measurements of the energy and charge of heavy cosmic-ray primaries in the region of the knee. It does so by exploiting the direct component of Cerenkov radiation emitted by these primaries prior to their first hadronic interaction in the atmosphere. The promise of the technique has recently been verified with measurements made by gamma-ray observatories.