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Lowering the ARGO-YBJ energy threshold to a few tens of GeV by using the double front shower events

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ARGO-YBJ, located at the YangBaJing Cosmic Ray Observatory (4300m a.s.l., Tibet, China), is a full coverage air shower array, with an energy threshold of about 300 GeV for gamma ray astronomy. Most of the recorded events are single showers, satisfying the trigger requirement of at least 20 particles detected in a given time window. However, in ~5% of the events, two randomly arriving showers may be recorded in the same time window, the second one, in general smaller, not needing to satisfy the trigger condition. These events are called double front shower events. By using these small showers, well under the trigger threshold, the detector primary energy threshold can be lowered to a few tens of GeV. In this paper, the angular resolution that can be achieved with these events is evaluated by simulations, and the capabilities of this technique in the search for GRBs are discussed.

Collaboration

ARGO-YBJ

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Primary author: Ms ZHANG, Yu (School of Physical Science and Technology, Southwest Jiaotong University)

Co-authors: Dr HUANG, Daihui (School of Physical Science and Technology, Southwest Jiaotong University); Prof. JIA, Huanyu (School of Physical Science and Technology, Southwest Jiaotong University); Prof. ZHU, Qingqi (Institute of High Energy Physics,CAS); Dr ZHOU, Xunxiu (School of Physical Science and Technology, Southwest Jiaotong University); Dr GUO, Yiqing (Institute of High Energy Physics,CAS)

Presenter: Dr ZHOU, Xunxiu (School of Physical Science and Technology, Southwest Jiaotong University)

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