

Name of research institute or organization:

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**University of Rome La Sapienza**

Title of project:

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Prototype study for measurement of cosmic ray at large zenith angle

Project leader and team:

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Prof. Maurizio Iori, project leader

Project description

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At the Jungfraujoch High Altitude Station, several measurements were performed to understand detector characteristics and its performances.

These studies were also aimed at the understanding of the possible sources of background from inclined atmospheric showers at large zenith angles.

Towers with different tile sizes have been installed: two towers are instrumented with tiles of dimensions  $12.5 \times 12.5 \times 2 \text{ cm}^3$  and are placed parallel to each other and about 50 cm apart, while another tower has tiles of  $20 \times 20 \times 1.4 \text{ cm}^3$  and was installed at a distance of 20 m from the other two.

The use of tiles with different sizes is aimed at the optimization of detector acceptance and time resolution.

NIM and Camac modules with low threshold discriminators, high resolution Time-to-Digital converter (TDC), and Analog-to-Digital converter (ADC) were used to trigger the tracks and measure the arrival time.

These studies need for the proposed detector array, TAUWER, described in astro-ph/050000, having good sensitivity for the interactions of UHE cosmic ray neutrinos that skim through the earth with zenith angles somewhat larger than 90 degrees to measure or set an upper limit on the flux of Earth-skimming tau neutrinos.

Key words:

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Cosmic rays

Scientific publications and public outreach 2006:

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Study of a detector array for upward tau air-showers. M. Iori, Antonio Sergi, Daniele Fargion (Rome U.), M. Gallinaro (Rockefeller U.), M. Kaya (Kafkas U.). Feb 2006. 18pp. e-Print Archive: astro-ph/0602108.

### **Talks and seminars**

25 Jan 2006: Detection of UHE tau neutrinos with a surface detector, Array Cea-Saclay, France

26 April 2006 : Detector Array for Upward Tau Air-showers International UHE Tau Neutrino Workshop, Beijing, China

29 June 2006 Detection of UHE tau neutrinos with a surface detector array, Gran Sasso laboratory, LNGS, Italy

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