



Contribution ID: 150

Type: Poster

## Performance of the EUSO-BALLOON Front-End Electronics

Here the performance of EUSO-BALLOON front-end electronics with dedicated detector elements will be reported.

EUSO-BALLOON is a balloon-borne pathfinder of the space-borne fluorescence detector JEM-EUSO (Extreme Universe Space Observatory on board Japanese Experimental Module) on board the International Space Station.

The goal of EUSO-BALLOON is to perform as a technological demonstrator of JEM-EUSO, to study the background and the detection of an atmospheric shower in a series of launches starting in 2014.

The EUSO-BALLOON focal surface consists of one Photo Detector Module (PDM) while the focal surface of JEM-EUSO will consist of 137 PDMs which corresponding to roughly 5,000 64-channel Multi-Anode Photomultiplier Tubes (MAPMTs). One PDM consists of 9 Elementary Cell units (EC\_units). Each EC\_unit contains 4 MAPMTs and a set of PCBs used to supply high voltages to the MAPMTs and to read out the output signals. These signals are transmitted to the front-end electronics, the EC-ASIC boards each of which contains 6 SPACIROC ASICs which has been developed for JEM-EUSO. To be operated in a space environment with a limited power budget, and covering a wide dynamic range for extreme energy cosmic ray ( $>5 \times 10^{19}$  eV) observation, the ASIC is designed to perform single photon counting in a dynamic range of 1 photoelectron (PE) to 300 PEs/pixel/2.5  $\mu$ s, with double pulse resolution of 30 ns, and low power consumption ( $<1$  mW/ch). During the year 2013, the flight model EC\_units and EC\_ASIC PCBs were produced and the performance was successfully tested and confirmed.

**Primary author:** MIYAMOTO, Hiroko (LAL/Univ. Paris-SudXI/IN2P3/CNRS)

**Co-authors:** Dr CARL, Blaksley (Université Paris Diderot Laboratoire Astro Particule et Cosmologie 10 rue A. Domon et L. Duquet 75013 Paris, France); Mr MORETTO, Camille (LAL/IN2P3/CNRS/Université Paris-Sud 11, Laboratoire de l'Accélérateur Linéaire, Bâtiment 200, 91898 Orsay Cedex, France); DE LA TAILLE, Christophe (OMEGA (FR)); Mr RABANAL REINA, Julio Arturo (LAL/IN2P3/CNRS/Université Paris-Sud 11, Laboratoire de l'Accélérateur Linéaire, Bâtiment 200, 91898 Orsay Cedex, France); GORODETZKY, Philippe (College de France); Dr BARRILLON, Pierre (a LAL/IN2P3/CNRS/Université Paris-Sud 11, Laboratoire de l'Accélérateur Linéaire, Bâtiment 200, 91898 Orsay Cedex, France); Mr BACHOLLE, Simon (Université Paris Diderot Laboratoire Astro Particule et Cosmologie 10 rue A. Domon et L. Duquet 75013 Paris, France); BLIN, Sylvie (CNRS); Dr DAGORET-CAMPAGNE, Sylvie (LAL/IN2P3/CNRS/Université Paris-Sud 11, Laboratoire de l'Accélérateur Linéaire, Bâtiment 200, 91898 Orsay Cedex, France)

**Presenter:** MIYAMOTO, Hiroko (LAL/Univ. Paris-SudXI/IN2P3/CNRS)

**Track Classification:** Experiments: 2b) Astrophysics and Space Instrumentation