

The MEV project: an innovative high-resolution telescope for Muography of Etna Volcano

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The MEV project started in 2016 the construction of an innovative muon tracking telescope expressly designed for the muography of the Etna Volcano, in particular one of the active craters in its summit area. The telescope is a tracker based on extruded scintillating bars with WLS fibers and featuring an innovative read-out architecture. It is composed of 3×1 m² XY planes; the angular resolution does not exceeds 0.4 msr and the total angular aperture is about $\pm 45^\circ$. A special effort concerned the design of mechanics and electronics in order to meet the requirements of a detector capable to work in a hostile environment such as the top of a tall volcano, at a far distance from any facility. The telescope was powered by solar panels in order to make it completely independent from external power source. The whole electronic chain was custom designed for this application in order to reduce the power consumption, which is about 20 W, including the wireless data transmission system. The test phase started in January 2017 and ended successfully at the end of July 2017. An extinct volcanic crater (the Monti Rossi, in the village of Nicolosi, about 15 km from Catania) was the target of the measurement, of which was acquired the first muographic image with a promising quality. Then, the telescope was moved to the summit zone of the Etna Volcano, with the aim of imaging the active North-East crater.

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