Contribution ID: **26** Type: **Recorded Presentation**

Borehole cylindrical detector: a compact muon tracker for Muon Radiography applications

Muon Radiography (or muography) is a recent imaging methodology that uses cosmic muons to investigate the interior of large objects, such as volcanoes, mines or buildings as the pyramids. Some applications are intended to use muography to search for hidden cavities in the subsoil. In many cases the muon telescope needs to be installed underground, inside tunnels, excavated chambers or drilled holes. Usually the available locations are difficult to be accessed by people and by big instrumentations; this issue suggested the idea to construct a very compact cylindrical muon tracker, which maximizes the acceptance respect to its small dimensions thanks to arc-shaped plastic scintillator that minimize the dead spaces. It is 1 m high and has a 24 cm diameter; these dimensions are ideal to fit a realizable drilled well.
The new borehole cylindrical detector is made of plastic scintillator elements, read out by SiPMs. Laboratory tests have been completed, and an open sky muon flux measurement is in good agreement with expectations. A first application on field is currently on going: the detector has been installed in the subsoil of Mt. Echia, a little hill in the center of the city of Naples, Italy, where a complex of cavities and tunnels, of very ancient origins, is present. The purpose of this application is to test the potentialities of the cylindrical muon tracker to detect hidden cavities in reasonable time. The detector design and some preliminary results will be presented.

Primary experiment

Author: Ms D'ERRICO, Mariaelena (INFN & Università degli Studi di Napoli Federico II)

Co-authors: Prof. AMBROSINO, Fabio (Università degli Studi di Napoli Federico II & INFN); Prof. SARACINO, Giulio (Università degli Studi di Napoli Federico II & INFN); ROSCILLI, Lorenzo (INFN); Dr CIMMINO, Luigi (Università degli Studi di Napoli Federico II & INFN); MASONE, Vincenzo (INFN)

Presenter: Ms D'ERRICO, Mariaelena (INFN & Università degli Studi di Napoli Federico II)

Track Classification: Astroparticle Detectors