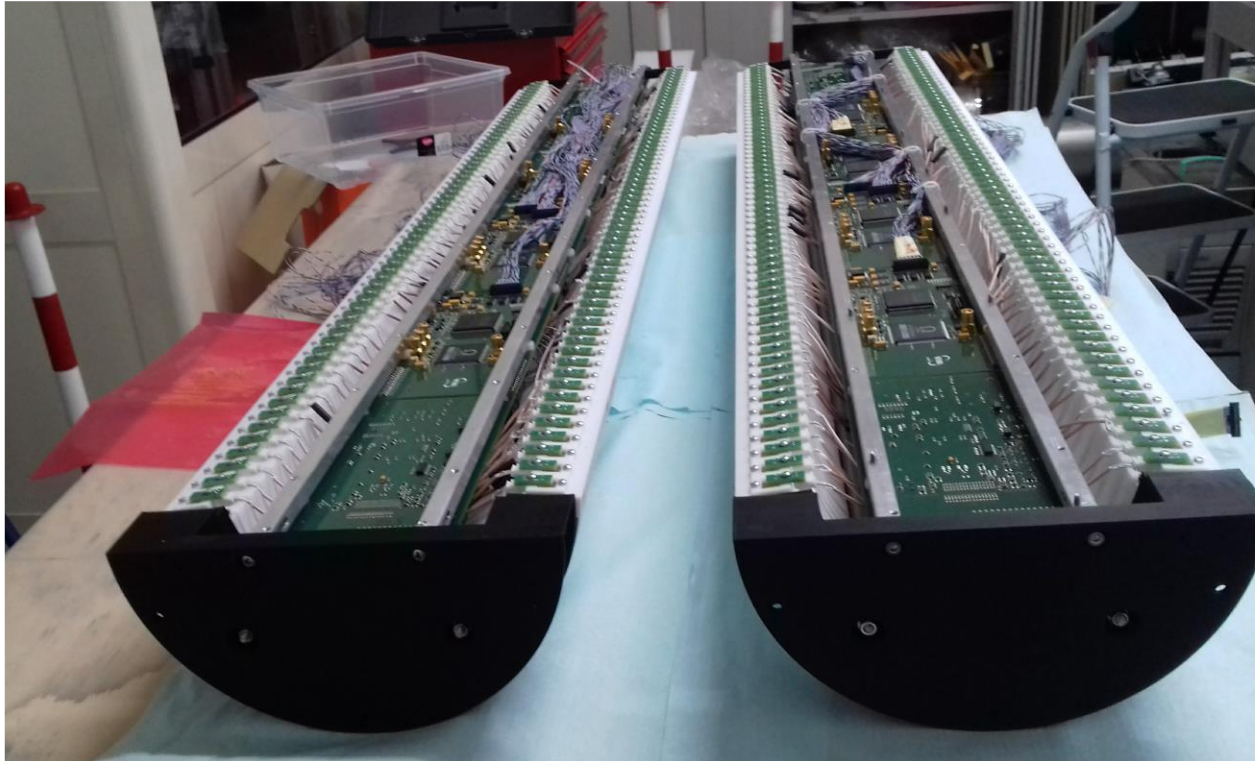


MUON RADIOGRAPHY FOR GEOLOGICAL INVESTIGATIONS



PRIORITY NUMBER:

102017000138317

KEYWORDS:

Muon Detector

Geological Investigations

Scintillators

Silicon

Scintillator detectors, realized in a suitable arrangement, can be effectively used as probes for geological investigations. By the measurement of the variations in cosmic muons flow and using dedicated reconstruction algorithms, it is possible to obtain a 3D density map of the subsoil, reaching depths up to about 100 m.

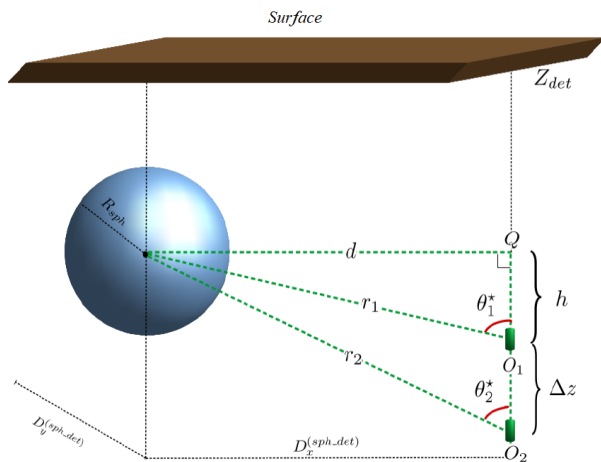


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DESCRIPTION :

The technology aims to the insertion of muon radiography in industrial contexts in the field of geological investigations. In particular it deals with a probe for cosmic muons tracking, based on scintillators optically coupled to Silicon photomultipliers. The geometric configuration with concentric cylinders allows, through dedicated methods, the reconstruction of the trajectory of the single muon in the three directions x,y,z. The detector comprises electronic control and processing systems specially devoted to the muons flux evaluation and its link with variations in the substrate density. The system looks like as an alternative for the prospection technologies (georadar, geoelectric, gravimetric and magnetic), giving a chance to carry out inspections almost independent from the substrate features, to reach higher depths, all mantaining low operation costs.



ADVANTAGES:

- Results almost independent from soil properties
- Better spatial resolution
- Mapping up to 100 m in depth
- Less mechanical complexity
- Costs reduction

APPLICATIONS:

- Geological investigations
- Archaeological sites explorations
- Cavity detection for engineering purposes
- Deposits identification in mining
- Identification of tunnels in the field of security