

CCC-based Muon Telescope for Examination of Natural Caves

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The REGARD group (Eötvös Loránd University and Wigner RCP RMI collaboration for R&D of gaseous detectors) developed a portable detector for environmental application: searching for large scale underground rock/soil inhomogeneities [1]. The designed muontomograph is based on the newly developed Closed Cathode Chamber (CCC) technology [2], which provide an cheap, easy handling, portable, high-resolution detector system, able to work even at extreme conditions (e.g. high humidity, low/high temperature). The developed muontomograph has about 0.1 square meters of detection surface with 10 mrad angular resolution, but it is small enough to deploy within difficultly-accessible cavern system where we used searching for hidden caverns.

Cosmic muon flux measurements had been performed using our muon telescope in natural caves: (1) the relief reconstruction of the hill above the Molnár János cave in Budapest were done, (2) unknown cavern searches in Ajándék Cave (Ariadne Cave System), Pilis Mountain, Hungary is under investigation.

[1] G. G. Barnaföldi et al.: Portable Cosmic Muon Telescope for Environmental Applications, Submitted to Nucl. Instrum. Meth. A (March 2012)

[2] D. Varga, G. Hamar and G. Kiss:
Asymmetric multi-wire proportional chamber with reduced requirements to mechanical precision
Nucl. Instrum. Meth. A648, 163 (2011).

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