New Design of Prototype Portable Muography Detector for Underground Cavities Imaging

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New Design of Prototype Portable Muography Detector for Underground Cavities Imaging

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Abstract: *The tomography using cosmic-ray muons, called as muography, is one of the competent techniques for density imaging of gigantic objects. To predict subsidence risk, we have developed a prototype portable muography detector for underground cavities imaging, called as Prototype-I [1]. The detector consists of two muon position sensitive detectors (mu-PSDs) having a function of muon tracker. The mu-PSDs are fabricated with plastic scintillator fibers and multi-pixel photon counters. The spatial resolution of 25 msr is required for the subsidence risk cavities detection. This resolution can be achieved by optimization of the detector configuration. A feasibility test of Prototype-I was performed by measuring the density profile of a seven-story building from its basement. The result demonstrates its capability of the muon tomography. To improve the performance for actual application, a new portable muography detector is now designing and fabricating. The detector design will be reported in our presentation.*

Keywords: Muography; Cosmic muon; Tomography; Muon detector; Plastic scintillator fiber.