

## The MUG experiment for observing muon fluxes underground: Test data and development plans

A.-M. Elo<sup>1</sup>, T. Jämsén<sup>2</sup>, J. Kangas<sup>1</sup>, K. Mursula<sup>1</sup>, J. Peltoniemi<sup>3</sup>, I. G. Usoskin<sup>4</sup>, M. Vallinkoski<sup>3</sup>, and E. Valtonen<sup>5</sup>

<sup>1</sup>Department of Physical Sciences, Linnanmaa, P.O. Box 3000, FIN-90014 University of Oulu, Finland

<sup>2</sup>Sodankylä Geophysical Observatory, Tähtelä, FIN-99600 Sodankylä, Finland

<sup>3</sup>CUPP, P.O. Box 3000, FIN-90014 University of Oulu, Finland

<sup>4</sup>Sodankylä Geophysical Observatory, Oulu unit, Linnanmaa, P.O. Box 3000, FIN-90014 University of Oulu, Finland

<sup>5</sup>Space Research Laboratory, Department of Physics, University of Turku, FIN-20014 University of Turku, Finland

**Abstract.** A new multilevel Muons UnderGround experiment (MUG) for observing muon fluxes underground is located in the Pyhäsalmi zinc mine in Central Finland. The detectors consist of vertically overlapping plastic scintillator pairs. Three scintillator pairs are situated on the ground level. Six pairs are 90 metres underground and another six pairs are 210 metres underground. The counting rates of coincident pulses in scintillator pairs are recorded in the preliminary phase of the experiment.

In this paper we study the test data obtained with the MUG instruments in order to check the acceptability of their operation. One purpose of the MUG experiment is to investigate the suitability of the Pyhasalmi mine as a location for scientific experiments. The test data are also examined in this respect. Development plans for the MUG experiment are also outlined in this paper.