

# Deployment and first results of muon counter modules of the AMIGA experiment, an enhancement of the Pierre Auger Observatory

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## Abstract

AMIGA is an enhancement of the Pierre Auger Observatory designed to lower the energy threshold to  $10^{17}$  eV, using a denser surface detector array, and also to study the chemical composition of the primary cosmic ray particles using muon counters. Each one of these muons detectors (MD) is comprised of three or four plastic scintillators, arranged to cover a  $30 \text{ m}^2$  area per Auger surface detector position. In this work we present the deployment procedure of the first seven AMIGA muon detector stations, in a hexagon of infill stations. These MDs are buried down to  $\sim 2.25$  m, to avoid the punch-through of electromagnetic particles (gammas and electrons) that may produce muon over-counting. We also describe the logistics and transportation of the detector modules from the Observatory yard to the site, the burying procedure, and the installation of an access pipe, the cabling and the power system. We also present the first results from the muon detectors, comparing field performance with laboratory measurements and simulations.