

A muon beam monitor for the CHNet-MAXI experiment at RIKEN-RAL laboratory

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The CHNet-MAXI (Muonic Atom X-ray and prompt gamma spectroscopy for Isotopic analysis for cultural heritage) is an INFN Cultural Heritage program funded by Scientific Commission V, aiming at selecting the best figures of merit in the isotopic analysis of lead by means of muonic atom emission. The experiment will be deployed at RIKEN-RAL facility ISIS-STFC (UK), providing a pulsed muon beams with momenta between 30 and 80 MeV/c. The CHNet-MAXI apparatus will be mainly based on a 9 HPGe detectors array and innovative scintillator detectors read by for the detection of the characteristic X and gamma rays emitted by isotopically enriched targets of Pb 204, 206, 207 and 208, to be exposed to the RIKEN-RAL muon beam. A muon beam hodoscope will be used as a beam x/y profiler and as a beam intensity monitor. This detector has been designed to provide a few mm spacial resolution, and it is based on 3 mm thick scintillating fibers, each read by a single SiPM at one edge. The setup is meant to be portable thanks to desktop HV and innovative open-FPGA DAQ modules. The data acquisition system is based on two 32-channel CAEN DT5560SE desktop digitisers, with a custom-made firmware written on SciCompiler, while the experiment DAQ will eventually be based on a 128-channel digitiser of the same family, CAEN R5560SE. This poster is illustrating all the phases of the design, assembly, and testing of the CHNet-MAXI hodoscope. Finally, first operation tests of this new beam monitor are shown.

Collaboration

CHNet-MAXI

Role of Submitter

I am the presenter

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