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Low consumption micromegas for muon tomography

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The recent development concerning MPGDs, in particular with the work done by the R&D51 collaboration, makes us able to build large and robust detectors. These characteristics suit well the needs of a lot of applications which use the cosmic rays muons to make the tomography of large objects. However, these applications need the muon telescope to be run outside and with a low energy consumption. After multiplexing the readout of micromegas and miniaturizing the high voltage power supply, we made the very first micromegas-based muon telescope which was operated outside. All the system needed to operate this telescope, including a credit card format computer, worked smoothly during more than a month of data taking with an overall consumption 25W. With these data we successfully made a density map of the water tower by measuring its muon shadow. Moreover, the analysis in progress aims to see the water level time fluctuations inside the tank. This work make MPGDs able to be used in many new fields like volcanology, archeology or mining exploration.

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