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The muon tomography Diaphane project : recent upgrades and measurements

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Muon tomography measures the flux of cosmic muons crossing geological bodies to determine their density. Large density heterogeneities were detected on la Soufrière de Guadeloupe revealing its very active phreatic system. These measurements were made possible thanks to electronic and signal processing developments. Indeed the telescopes used to perform these measurements are exposed to noise fluxes with high intensities relative to the tiny flux of interest. A high precision clock permitted to measure upward-going particles coming from the rear of the telescope that used to mix with the volcano signal. Also the particles energy deposit inside the telescope shows that other particles than muons take part to the noise. We present data acquired on la Soufrière, mount Etna in Italy, and in the Mont Terri tunnel in Switzerland. Biases produced on density muon radiographies are quantified and correction procedures are applied.