



imaging volcanos with gravity and muon tomography measurements

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Both muon tomography and gravimetry are geophysical methods that provide information on the density structure of the Earth's subsurface. Muon tomography measures the natural flux of cosmic muons and its attenuation produced by the screening effect of the rock mass to image. Gravimetry generally consists in measurements of the vertical component of the local gravity field. Both methods are linearly linked to density, but their spatial sensitivity is very different. Muon tomography essentially works like medical X-ray scan and integrates density information along elongated narrow conical volumes while gravimetry measurements are linked to density by a 3-dimensional integral encompassing the whole studied domain. We show that gravity data are almost useless to constrain the density structure in regions sampled by more than two muon tomography acquisitions. Interestingly the resolution in deeper regions not sampled by muon tomography is significantly improved by joining the two techniques. Examples taken from field experiments performed on La Soufrière of Guadeloupe volcano are discussed.