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Inside and around the roman town of Grumentum: the contribution of LiDAR and historical air photography

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The papers deals with the integration of aerial laser scanning, multitemporal satellite and aerial dataset to provide information on the 'forma urbis' of the Grumentum roman town, to detect new archaeological features in its close surrounding and to analyze changes of the landscape over the time.
Grumentum is an ancient town, 50 km south of Potenza (Southern Italy), located near the 'Via Herculea' connecting Venusia, in the north est of Basilicata, with Heraclea in the Ionian coast. The first settlement date back to the 6th century BC. Then, it was resettled by the Romans in the 3rd century BC. The town, which evidences a long history from the Republican age to late Antiquity (III BC-V AD), is characterized by the typical urban pattern of 'cardi' and 'decumani'. Its excavated ruins include a large amphitheatre, a theatre, the thermae, the Forum and some temples.
LiDAR data, adequately filtered, classified and post processed by using geostatistics methods(Lasaponara et al. 2012), enabled to detect features linked to tombs under a dense vegetation located close to the urban perimeter. The analysis of historical air photos, draped over the ground surface obtained from the LiDAR survey, put in evidence some unknown crop-marks linked to roman urban fabric. Finally, the same photos along with the satellite multitemporal dataset allowed us to reconstruct the recent history of the landscape from the Agrarian Reform, in the 50s, up today.

Reference

Lasaponara R., Masini N., Holmgren R., Backe Forsberg Y., Integration of aerial and satellite remote sensing for archaeological investigations: a case study of the Etruscan site San Giovenale, Journal of Geophysics and Engineering, vol. 9, S26-S39, doi:10.1088/1742-2132/9/4/S26