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On the LiDAR contribution for landscape archaeology and palaeoenvironmental studies: the case study of Bosco dell'Incoronata (Southern Italy)

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Abstract. This paper focuses on the potential of the latest generation of Airborne laser scanning (ALS) for the detection and the spatial characterization of microtopographic relief linked to ancient landscapes and palaeoenvironmental features. ALS is an optical measurement technique for obtaining high-precision information about the Earth's surface including basic terrain mapping (Digital terrain model, bathymetry, corridor mapping), vegetation cover (forest assessment and inventory), coastal, and urban areas. Recent studies examined the possibility of using ALS in archaeological investigations to identify earthworks, although the ability of ALS measurements in this context has not yet been studied in detail.

In this study, the investigations based on ALS survey and aerial photos were carried out for the natural protected area, Bosco dell'Incoronata in the Apulia Region (Southern Italy). The investigated area is an important site from the naturalistic, historic and archaeological point of view. It is an ancient lowland forest, still present in the medieval time, which has been characterized by a long and intensive human activity from Neolithic to Middle Ages. The LiDAR based analysis allowed us to identify features not visible from ground or from optical data set because hidden by forest canopy and dense understory. The DTM enabled us to identify some microtopographic relief linked to traces of past landscapes, as in the case of the Cervaro paleaoriverbed. It is quite interesting to note that the river changed many times from North to South side compared to the present stream, and traces of past human activities can be still evident close to the diverse paleaoriverbeds. Nevertheless, intensive and systematic study of the ancient landscapes of the Bosco dell'Incoronata is just beginning and so far questions tend to be raised rather than answered.

The current study emphasizes the potential of aerial LiDAR (Light Detection And Ranging) survey for detecting surface discontinuities and microtopographic relief linked to palaeoenvironmental features, even hidden by under dense canopy and understory.

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