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Mapping and analyzing landforms around archaeological sites in Kayseri region, Turkey

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Physical environments including landforms have significantly affected human activities in ancient periods. Geographical analysis on such environments around archaeological sites is therefore essential for the understanding of ancient cultural developments. Although detailed topographic maps in remote areas are often limited, recent technologies including measurement equipment and GIS have enabled on-site acquisition of such maps for geographical surveys. Here we apply the methodology of laser measurement, SfM-MVS (structure-from-motion multi-view stereo) photogrammetry and GNSS (global navigation satellite system) for detailed, high-definition topographic mapping of characteristic landforms around archaeological settlements (mainly B.C. 3000 - A.D. 1000) in Kayseri region, central Turkey. The landforms include alluvial fans, fault scarps, plains with lakes and hummocks in debris avalanche deposits. The resultant data, including high-resolution DEMs (digital elevation models) and orthorectified photographs, allow analyzing land surface structures and geomorphological mapping. The data will be further examined to clarify spatiotemporal relationships of archaeological settlements and landforms.

Keywords: geoarchaeology, landform classification, digital elevation model, SfM-MVS photogrammetry