

## Geoarchaeological survey with rapid topographic mapping system in Kayseri, Turkey

# Yuichi S. Hayakawa[1]; Hiro'omi Tsumura[2]; Kontani Ryoichi[3]; Fikri Kulakoglu[4]

[1] Geoenvironmental Sci., Univ. Tsukuba; [2] none; [3] Notre Dame Seishin Univ.; [4] Ankara Univ.

Topography is a basic environmental factor that affects cultural human activities in ancient periods. Data of topography such as topographic maps and DEMs (Digital Elevation Models) are thereby a fundamental material for geoarchaeological studies, although detailed topographic data suited for the surveys are often unavailable especially in remote areas. However, traditional or highly-technologized methods of topographic measurement, including plane-table survey, total station survey, photogrammetry of high-resolution satellite imagery and airborne laser swath mapping, are often expensive and/or time-consuming. An effective method for field measurement of topography using a LRF (Laser Range Finder) and DGPS (Differential Global Positioning System) have then been proposed, enabling on-site quick (tens of minutes to several hours for a  $10^4$ - $10^6$  m<sup>2</sup> area) acquisition of detailed topographic data with submeter accuracy. Here we apply this method to some archaeological sites in Kayseri region, central Turkey as a part of general survey of an archaeological project. Digital topographic dataset were obtained for many sites of Tepe (archaeological mound), allowing us to investigate detailed topography of the archaeological sites and its relationships to the historical development. Some of the detailed topographic data suggest the existence of buried buildings and walls, which had never been identifiable by existing low-resolution topographic datasets.