



Satellite and aerial data as a tool for digs localisation and their verification using geophysical methods

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The Middle Europe such as next world cultural centres are inhabited by humans tens of thousands years. In the last ten years, new methods are implemented in archaeology. It means new sensitive geophysical methods, very high resolution remote sensing and Airborne Laser Scanning (ALS). This contribution will refer about new technological possibilities for archaeology in the Czech Republic to two project examples. VHR satellite data or aerial image data can be used for searching of potential archaeological sites. In some cases, orthophoto mosaic is very useful; nowadays, different aerial orthophotomosaic layers are available in the Czech Republic (2002-3, 2006 and 2009) with pixel resolution 25cm. The archaeological findings are best visible in the Czech Republic by their vegetation indices. For this reason, the best time for data acquiring is mid of spring, in rapid vegetation process. Another option is the soil indices – the best time is early spring or autumn, after crop. A new progressive method is ALS, which can be used for spatial indices. Since autumn 2009 the entire area of the Czech Republic is mapped by technology of ALS. The aim of mapping is to get authentic and detailed digital terrain model (DTM) of the Czech Republic. About 80% (autumn 2012) of the Czech territory is currently covered by the DTM based on ALS. The standard deviation of model points in altitude is better than 20cm. The DTM displayed in appropriate form (as shaded surface) can be used as a data source for searching and description of archaeological sites – mainly in forested areas. By using of above mentioned methods a lot of interesting historical sites were discovered. The logical next step is a verification of these findings by using terrestrial methods – in this case by using of geophysical instruments. At the CTU Prague, the walking gradiometer GSM-19 and georadar SIR-3000 are at disposal. In first example the former fortification from Prussia – Austrian was localized on orthophoto mosaic and QuickBird satellite data. Normally is not visible from the surface. Secondary was fortification localized on shaded relief by spatial indices. Last verification has been made by walking magnetometer. Second example is joining of both magnetometers and GPR data. These technology and 3D modelling was used for localisation and verification of unknown tomb in the neighbourhood of church ruins in Panensky Tynec.