Ludwig Boltzmann Institut
Archäologische Prospektion und Virtuelle Archäologie

PL2 Case study Uppåkra 2010

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Main Author: Immo Trinks
Co-authors:
Collaborators: Wolfgang Neubauer, Alois Hinterleitner, Erich Nau, Thomas Zitz, Manuel Gabler

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Abstract:

In the second half of August 2010 the first geophysical archaeological prospection fieldwork for the Case Study Uppåkra was conducted by PL2 in cooperation with the Swedish LBI Partner UV Teknik and the University of Lund.

The purpose of the Case study is on the one hand the test and development of novel measurement devices, the improvement of measurement methodology and the development and adaptation of corresponding data processing software, as well as on the other hand the large-scale collection of high-resolution survey data for subsequent archaeological interpretation and research: the collected data will serve the development of novel processing algorithms for integrative archaeological interpretation and landscape archaeological research by PL3.

The 2010 fieldwork campaign at Uppåkra was the first in this specific case study and therefore of importance regarding the planning of future campaigns, both logistically and in regard to the scientific results.

Detailed report

The first fieldwork campaign in the framework of the case study Uppåkra was very successful. The motorized five-probe Förster gradiometer magnetic prospection system using a new 5 channel A/D converter and data logging software was tested on large areas to the south and south-east of the assumed settlement site. Within a single day up to 15 hectares of area were surveyed. Several versions of a by Daniel Scherzer developed software prototype for magnetometer data recording and navigation were tested and feedback provided. The mechanical limits of the magnetometer system were tested through continuous high-speed surveying. A solution for the mechanical strain on the magnetometer cart, particularly on axes and wheel bearings, still has to be developed.

Software development for magnetic and GPR data processing was conducted in close collaboration with Alois Hinterleitner in Vienna. The MIRA georadar system was used extensively and problems in regard to positioning when using a totalstation were addressed through test measurements. Single channel GPR measurements were conducted with PulseEkko Pro 500 and 250 MHz systems mounted in a SmartCart on areas which were inaccessible with the MIRA system or where the use of the tractor would have caused damage to the lawn. A grave mound located circa 50 m south-west of Upppåkra churchyard was scanned with single channel GPR measurements.

Over the course of seven days in total 10 hectares of area were covered with high-resolution GPR measurements, and 40 hectares with magnetometer measurements. The data show a great number of clearly visible archaeological structures, which to a large extent will be archaeologically interpretable. Numerous pits, postholes and accumulations of stones can be seen in the data. A clear delimitation of the prehistoric settlement site Uppåkra to the south/south-east is visible in the magnetic data.

Several anomalies in the magnetic data indicate the presence of prehistoric graves and grave fields. A possibly older settlement was detected at the northern edge of a former wetland to the south-east of the known Uppåkra settlement site, possibly indicating a continuation of settlements in a temporal and landscape archaeological context.

Before the end of the fieldwork phase all acquired data was integrated into a GIS project, including archaeological excavation maps, historical maps and recent map data in WGS84 UTM 33 N coordinate system.

A collaboration agreement regarding the dissemination of the research results and the logistical support of the project through the University of Lund (Prof. Lars Larsson) was formulated and discussed with Prof. Larsson and its stipulation agreed on.

In the course of a press conference local journalists were informed on site about the LBI and this specific case study. This resulted in two publications in the newspapers "Sydsvenskan" and "Skånskan", and a report on a local channel of Swedish National Radio.

A presentation of the LBI case study and first results to sponsors of the archaeological excavation project lead by Prof. Lars Larsson was received with great interest.

After the end of the fieldwork the preliminary results were presented to the Swedish LBI Partner UV Teknik and collaboration partner Prof. Lars Larsson and the members of his archaeological excavation team, who all were very pleased and impressed. LBI Partner UV Teknik received a backup copy of all data and project files.

MEDIA LINKS:
http://www.skanskan.se/article/20100824/STAFFANSTORP/708249813
http://www.sydsvenskan.se/omkretsen/staffanstorp/article1210916/Ny-teknik-snabbar-pa-utgravningar.html

Activities:
The fieldwork at Uppåkra commenced on the 19th of August 2010 with the arrival of the survey team consisting of Erich Nau, Thomas Zitz and Manuel Gabler. Initially test measurements with the MALÅ Imaging Radar Array (MIRA) were conducted with the purpose to test positioning accuracy when using a total station for positioning. The lawn SW of Uppåkra churchyard was surveyed with a manually operated 500 MHz PulseEkko GPR system. The so called triangle field SW of the farm and W of the road was surveyed with the motorized magnetometer system. In order to make good use of the dry weather fieldwork continued on Saturday August 21st.

On the evening of Sunday 22nd Immo Trinks joined the survey team. On Monday the triangle field was surveyed with MIRA, the new data logging and navigation software was tested. The cabling between the MIRA system and the tractor got damaged when the antenna array came off the front mount.

On Tuesday 23rd the MIRA system was fixed and used for the survey of the horse paddock between the farm and the churchyard. The fields immediately south of the churchyard where not suitable for MIRA use due to crops on the surface left for drying. Single channel GPR measurements were conducted across the grave mount. In the evening Wolfgang Neubauer was collected from Copenhagen airport.

On Wednesday 24th large areas were surveyed to the south and south-east of the assumed Uppåkra settlement site using the magnetic system. The MIRA system was used for the survey of areas south of the farm building.

On Thursday 25th a press conference was held, while the magnetic and MIRA measurements continued. New accommodation for future fieldwork campaigns was inspected and found.

On Friday 26th the area immediately south of the churchyard was surveyed. The magnetometer system had broken down due to wheel and bearing damage. First results to Lars Larsson and UV Teknik and the equipment packed for transport to Norway.

Estimated overall work hours: 260