Comprehensive non-invasive archaeological exploration and mapping of the Swedish Viking settlement and UNESCO World heritage site Birka and Hovgården

Immo Trinks[1,2], Wolfgang Neubauer[2,1], Mario Wallner[2], Klaus Löcker[2,3], Geert Verhoeven[2], Erich Nau[4], Manuel Gabler[4], Alois Hinterleitner[2,3], Agata Lugmayr[2], Katalin Tolnai[1], Tanja Trausmuth[2], Lisa Aldrian[2], Knut Paasche[4]

[1] University of Vienna, Vienna Institute for Archaeological Science
[2] Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna
[3] Zentralanstalt für Meteorologie und Geodynamik, Vienna
[4] Norsk institutt for kulturminneforskning, Oslo

Email: immo.trinks@univie.ac.at

In Scandinavia, the first proto-urban settlements emerged in the Viking Age. Possibilities for their scientific investigation using traditional archaeological excavations are highly limited by the spatial extent coverable and the fact that excavation inevitably destroys the archaeological site under investigation. Latest non-invasive surface and subsurface archaeological prospection methods, such as remote sensing using airborne laser scanning, large-scale magnetometry and high-resolution ground penetrating radar surveys, offer the possibility to explore and map entire settlements and corresponding cemeteries in great detail, without altering the archaeological remains in the subsurface.

The Swedish UNESCO World Heritage Site Birka and Hovgården represents an outstanding example of Scandinavian Iron Age/Viking Age culture, preserved in form of buried settlement remains and numerous graves that partly are still visible above ground as burial mounds. With the cemetery Hemlanden and further grave fields, Birka on the island of Björkö in Lake Mälaren comprises Scandinavia's largest known accumulation of Iron Age/Viking Age burial mounds. Birka's Black Earth area contains up to two metres thick stratification of buried archaeological settlement remains. No extensive excavations have disturbed the subsurface, nor has intensive agriculture damaged the archaeological remains, and no significant building activities have altered the surface or subsurface. Therefore, Birka and Hovgården represent a uniquely preserved Viking heritage site that is ideally suited for the scientific exploration, mapping and investigation using non-destructive archaeological prospection methods.

Since 2011, a comprehensive non-destructive archaeological prospection case study has been conducted at Birka, for the first time revealing and documenting in unprecedented detail the buried remains of Viking Age architecture in form of building remains, house plots, track ways, a large number of previously unknown graves, remains of burial mounds, chamber graves, and many further structures of archaeological interest. This landscape-scale archaeological prospection case study resulted in substantial new knowledge on the structure, layout and development of this proto urban settlement. We present the context of this case study, the chosen exploration and investigation approach and involved technology, as well as the results of the GIS based archaeological interpretation of the very substantial geophysical prospection data sets that have been generated.