First results of the geophysical survey in Sikyon

Katharina Rusch, Harald Stümpel, Wolfgang Rabbel

Since 2015 a geophysical survey has been conducted in the plain southwest of Kiato by the Institute of Geosciences of Kiel University in cooperation with the National Museum of Copenhagen, the Ephorate of Antiquities in Corinth and the Danish Institute at Athens. The first aim of the survey was the localization of the Archaic and Classical settlement of Sikyon and to gain as many information as possible about its topography and structure. The second aim was the localization of the ancient silted-up harbor.

The backbone of the archeological prospection is the magnetometry, and in Sikyon this was also the first method applied (together with Eastern Atlas, Berlin) next to an archaeological survey. Many small, densely planted orchards and a great amount of metal on the surface (e.g. of the irrigation systems) hindered the magnetic measurements by some degree. However, a large area was surveyed in these two years and it showed many interesting and, archeological speaking, promising anomalies (**see Figure 1**).

Because the anomalies are not easily interpreted, further investigations were needed. This was accomplished by using different geophysical methods. To gain more information about material, depth and size ground-penetrating radar (GPR), electrical resistivity tomography (ERT) and seismic measurements were applied. Due to the silty soil with its high absorption GPR was not able to resolve any archeological structures in the plain. ERT, however, showed great results in mapping archeological remains in the subsurface and was able to even detect structures that do not show up in the magnetic map. In this way following findings were made:

1) A probable city wall (depth >1.0m) with adjacent architectural remains in a depth of 0.4-1.2m (see **Figure 2**) in a field east of the highway in the northern part of the survey area (area A).
2) ERT-anomalies (0.3-1.6m depth), which are likely caused by walls in a field on the first terrace west of the highway (area D).
3) Two parallel high resistivity anomalies (depth > 0.8m), which are likely due to a geological structure, but might also be connected to archeological remains (area E).
4) A complex system of linear anomalies in the magnetic map and the ERT results that are not easily interpreted (area H) but might be connected to the city wall or a street.

In addition to these ERT findings seismic measurements have proven to be successful so far in detecting changes in lithology. In the harbor area near the outskirts of Kiato the dispersion analysis of seismic surface waves show a 30m wide through of low seismic velocity (v_s=230m/s), which interrupts

a layer of gravel or weathered bedrock (v_s=450m/s). This low velocity indicates silty sediment that is most likely deposited in slow flowing water and might indicate the harbor location.

Katharina Rusch
Christian-Albrechts-Universität zu Kiel
Institut für Geowissenschaften, Abteilung Geophysik
Otto-Hahn-Platz 1, D-24118 Kiel
E-mail: katharina.rusch@ifg.uni-kiel.de

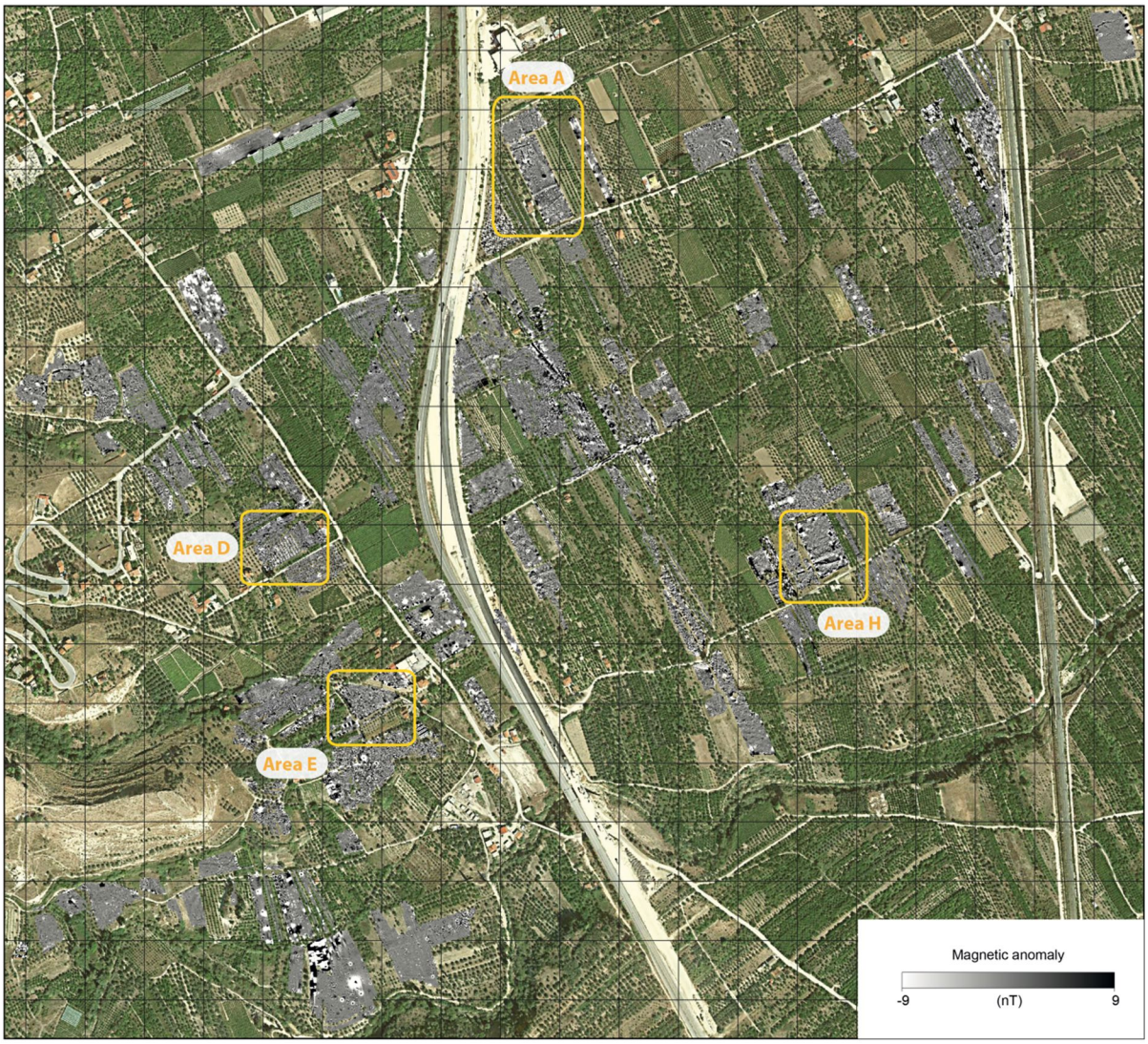

Fig 1: Magnetic map of the Sikyon survey area. Marked are the subareas and the locations of the other methods.

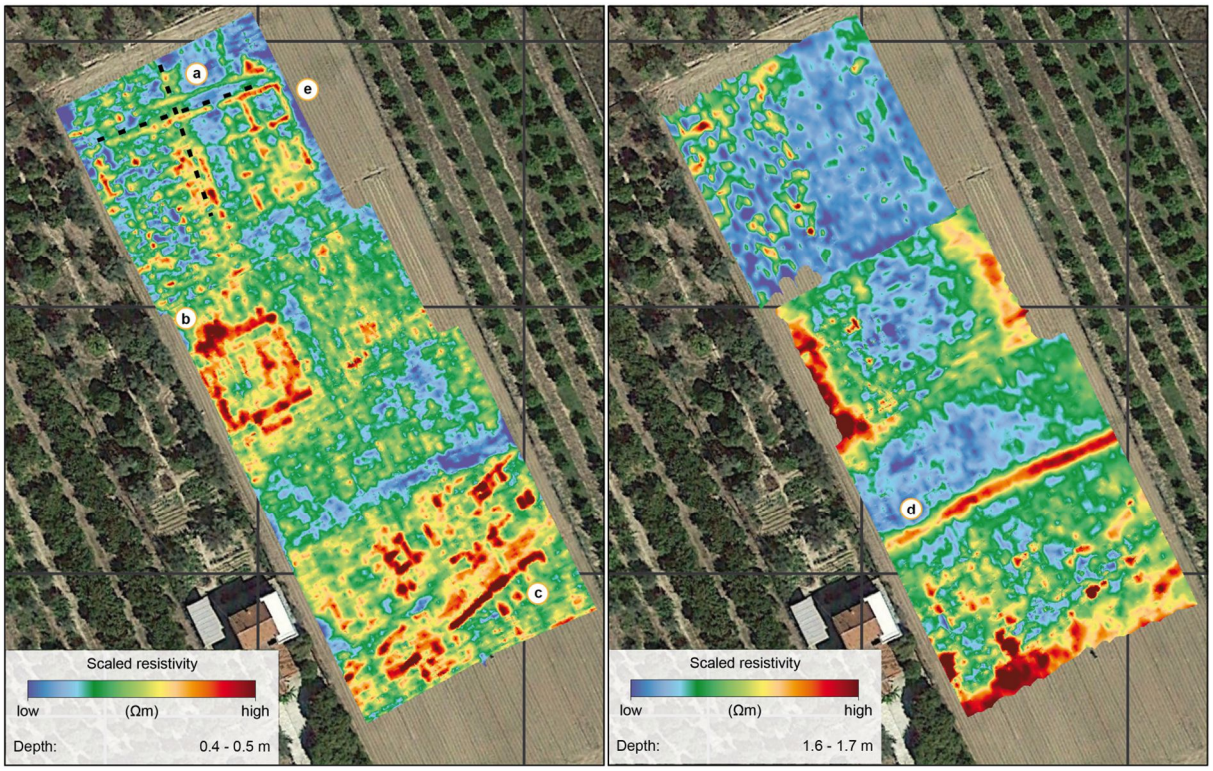

Fig 2: ERT depth slices of area A.