

# Prospecting in the marshland: the Sumerian city Fara-Šuruppak (Iraq)

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## Abstract

Fara-Šuruppak was a major Sumerian city of the third millennium B.C. By magnetometer prospecting we discovered and traced a casemate city wall that enclosed the city. On the west bank of the Euphrates river we identified a large harbour complex of Fara-Šuruppak. The magnetogram revealed the existence of channels, a bridge, hydraulic constructions and agricultural fields.

## Keywords

data interpretation; Fara-Šuruppak; magnetometer prospecting; mudbrick features; Sumerian city

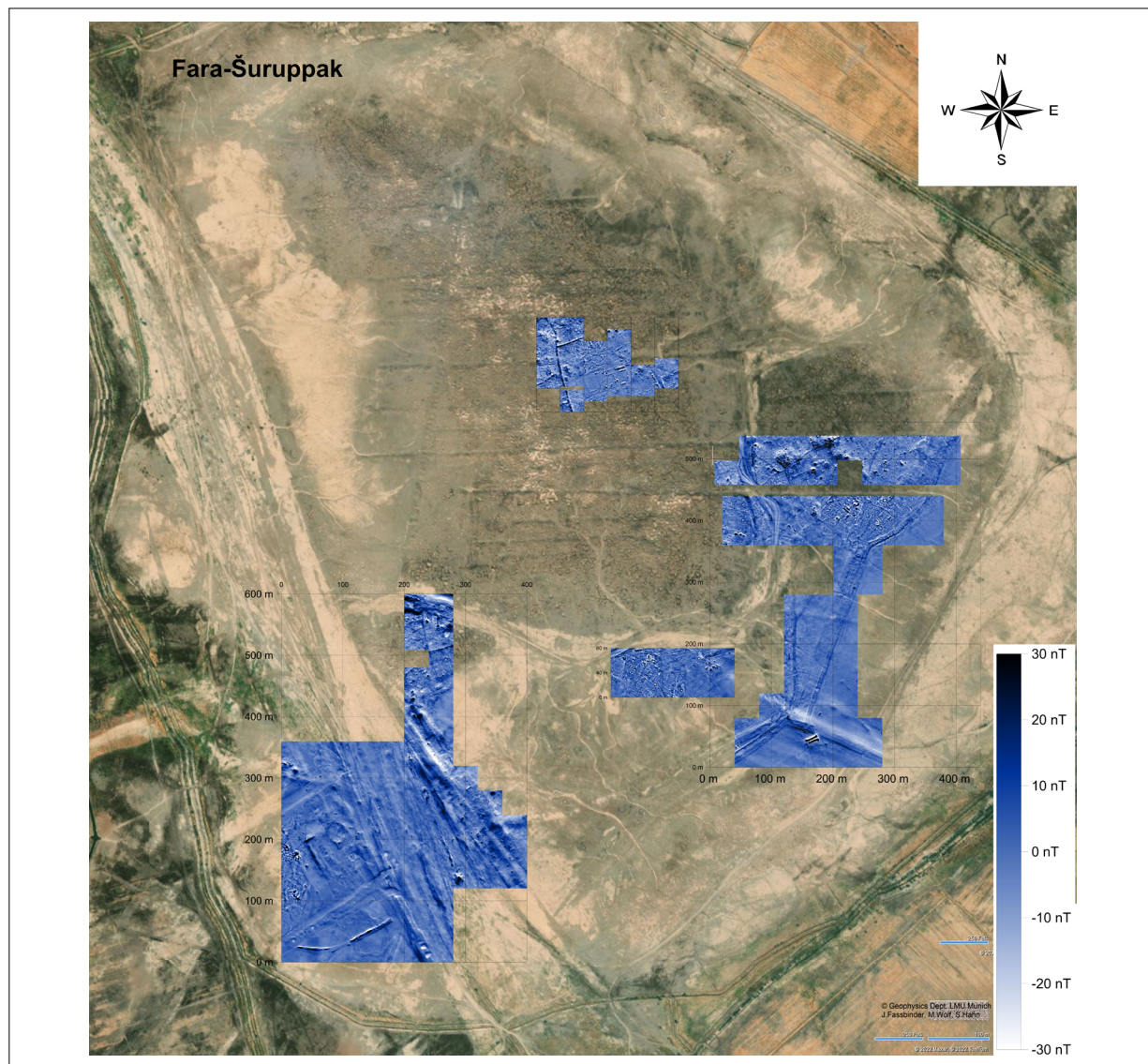
## Introduction

Fara-Šuruppak, situated along one of the ancient river courses of the Euphrat in south-central Iraq, dates back to the Jemdet Nasr period around 3000 BC with a continuous occupation until the end of the Ur III period around 2000 BC. Besides Eridu, Kish, Uruk, Ur, Nippur, Umma, Lagash and Larsa, to name only a few, Fara-Šuruppak was among the most prominent city-states of Sumer. Šuruppak is named as the seat of the last dynasty before the Flood in the Sumerian King List. Its mythical king is said to have built a ship (“Noah’s Ark”) to evacuate his people. First explorations and excavations were undertaken under the direction of Walter Andrae by the Deutsche Orient-Gesellschaft in 1902 and 1903 (Heinrich and Andrae 1931). In 2017, the Institute of Near Eastern Archaeology of the LMU-Munich started the “Fara Regional Survey Project (FARSUP) (Otto et al. 2020) in cooperation with University Al-Qadisiyah (Abbas Al-Hussainy). Magnetometer prospecting was commenced in 2018 and continued in 2022. The site is devoid of vegetation and thousands of deep looting pits cover the majority of the mound. We therefore focused our magnetometer prospecting on a few selected areas on the mound and the less looting-affected outskirts of the city. The highlights of the survey so far are

the discovery of the city wall, evidence of a large harbor complex, traces of ancient agriculture, watercourses and a bridge, among others. The revealed layout of a unique building complex in the center of the mound, likely a temple, complements the ancient excavations by Walter Andrae (Hahn et al. 2022).

## Approach

The pear-shaped tell of Fara-Šuruppak is nowadays extremely destroyed by the thousands of looting pits. Large trenches, up to 900m long, 5m wide and still up to 3 m deep, are the remains of Walter Andrae’s excavations in 1902/03, intersecting the tell into several areas from east to the west. The survey was conducted with total field cesium-vapour magnetometers in uncompensated “duo sensor” configuration with the Scintrex SM4G-Special and the Geometrics G858 magnetometer. As with geophysical survey at similar locations of Mesopotamia e.g. Uruk (Fassbinder et al. 2005; Becker et al. 2019), Larsa (Darras et al. 2021) or Charax-Spasiou (Lambers et al. 2019), the sites are not only difficult to access, but one also has to cope with a soft and sometimes muddy ground. Large-scale prospecting by a wheeled devised system or with a motor-



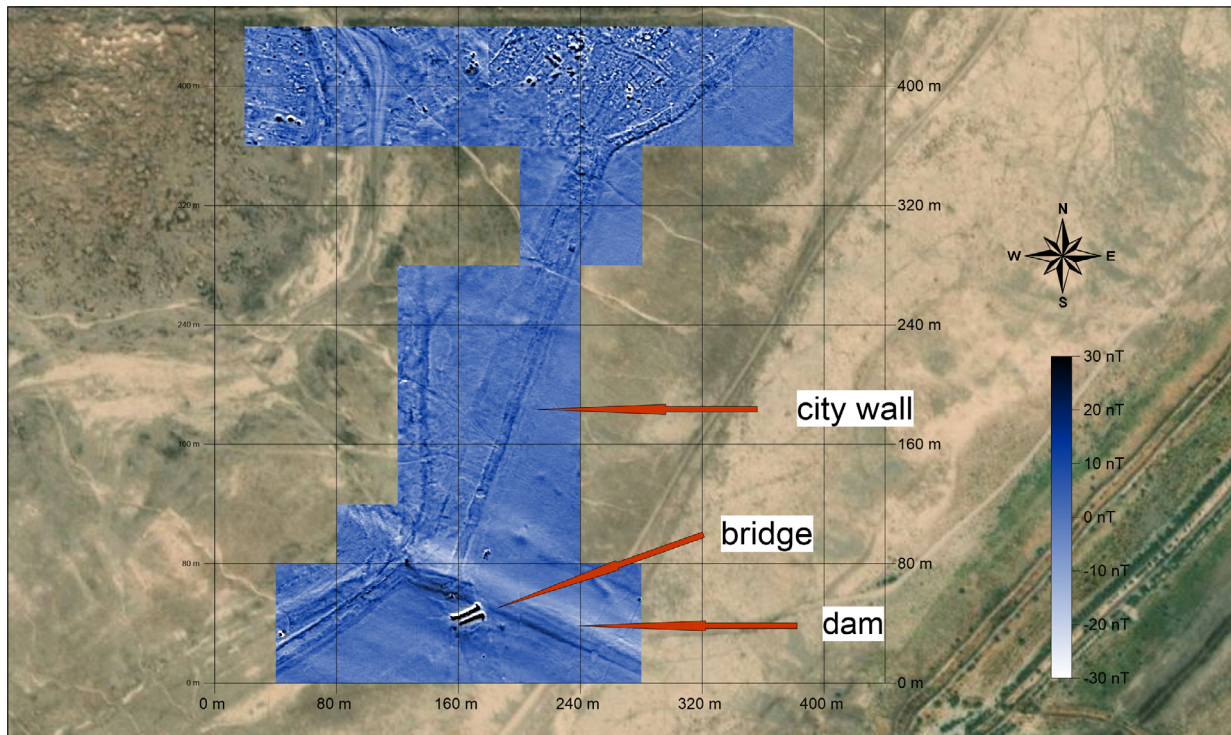
**Fig. 1:** Fara-Šuruppak. Satellite image of the mound (dark brown) and the adjacent area with the outskirts and ancient river courses fused with the magnetogram image (blue). (base map: Google, ©2023 CNES/Aibus, Maxar Technologies).

ized vehicle is utterly impossible. Driving off-road, particularly on footpaths, is unfeasible or would severely damage the archaeological site. Except from a partially solidified area in the center of the mound, we therefore first concentrated our survey first on the lower and flat area of the site.

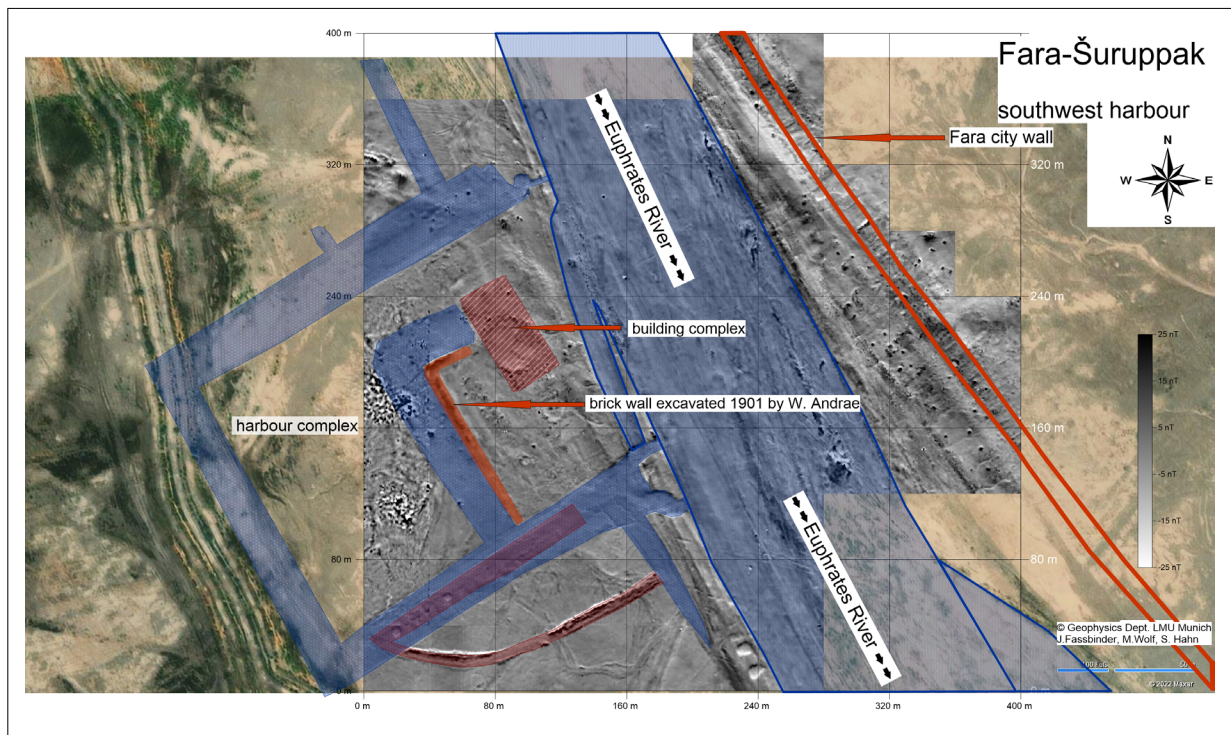
## Results

The first important finding of our magnetometer survey was the indisputable proof of the existence of a city wall. With the results of 2018 – 2022, we were able to trace

its remains on a length of ca. 900 m (see Figs. 1-3). The wall, up to 12 m wide, resembles a casemate wall (Fig. 2), which is very similar to some sections of the city wall in Uruk. So far, we have not yet found a city gate. In the east, next to the city wall, we detected traces of an ancient agriculture fields, intersected by dams and an extremely high magnetic anomaly, probably of a bridge or a sluice, similar to the finding of the French prospecting team in Larsa (Darras et al. 2021). Between the elevated part of the mound and the lower plain, we were able to trace city quarters, shapes of houses and a canal separating the area to the east and south from the main mound. Roads, pa-



**Fig. 2:** Fara-Šuruppak. The South East survey area covers a large section of the city wall; outside we detect agricultural fields, dams, as well as one of Mesopotamia’s rare bridges (base map: Google, ©2023 CNES/Aibus, Maxar Technologies).



**Fig. 3:** Fara-Šuruppak. Opposite the western part of the city and the ancient Euphrates River locates the harbour. Canals, dams and hydraulic features enclose the port itself; a massive wall, probably quay borders the T-shaped harbour basin in the center (base map: Google, ©2023 CNES/Aibus, Maxar Technologies).

thways and towpaths along the main channel are characterized by their linear positive (dark) anomalies.

On the west bank of the ancient Euphrates palaeo-channel branch we find a large elevation of about 200x250 m, which is enclosed by canals and connected to a T-shaped basin in the center of the area to the south (Fig. 3). Andrae's excavation unearthed here a massive wall but could not explain its function. The magnetogram image reveals that this wall very probably belongs to the quay of an inland harbour.

## Discussion

Archaeological prospecting in the sediments and old marshes from southern Mesopotamia offers a thankful field for the application of magnetometry and Earth Resistivity Tomography (ERT) (Parsi et al. 2018). Sundried mudbricks, sometimes tempered by pottery shreds or fired bricks, provide a high-contrasting magnetogram image and dynamics of  $> \pm 30$  nT compared to the total field. In addition, the remains of riverbeds and canals as well as the ancient agricultural fields leave clear traces in the magnetic image.

## Conclusion

The salient characteristic of the sites and cities in southern Mesopotamia is the environmental conditions under which they were built. Contrary to what the numerous results of magnetometer prospecting at other archaeological sites in wetlands and marshes around the world might suggest, the majority of building constructions, mainly made from sundried mudbricks, the ancient river courses, the Euphrates River, canals, sluices, hydraulic constructions and traces of ancient farming provide us with an extraordinary magnetic contrast for successful prospecting. Excavations of channels, watercourses or large hydraulic constructions would be not only a time-consuming, expensive and unattractive approach for archaeologists but are also not in the focus of traditional digs. Archaeological geophysics, particularly magnetometry, is therefore an even more important tool, as it provides indispensable contributions to the general understanding of the organization and infrastructure of such sites. ■

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