beginning to respond to this by considering how and where magnetometer surveys should be used in the future and where other, more appropriate techniques, might be beneficial.

3-D GPR INVESTIGATION OF A RESIDENTIAL AREA IN THE ROMAN TOWN AMMAIA (PORTUGAL).

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Ammaia is situated about 10 km west of the border between Portugal and Spain, south of the village of São Salvador da Aramenha (district of Portalegre). Except for a few farms, the site has remained virtually undisturbed by modern construction. Since 1994, excavations undertaken by the Fundacão Cidade de Ammaia and the universities of Évora and Coimbra, have focused mainly on areas marked by extant structures, such as the *forum* and the southern gate. Since April 2009, the Radio-Past project (www.radiopast.eu) combines different geophysical and other prospection techniques to map the entire area of the Roman town and its surroundings.

Since most of the site is covered with sandy silt colluvium, conditions were expected to be favourable for ground-penetrating radar (GPR). The first GPR survey was carried out in May 2008 over part of the *forum* and the adjacent baths (Verdonck *et al.*, 2008). In the next years, a fluxgate gradiometer survey investigated the biggest part of the intramural area, and in smaller areas earth resistance surveys were conducted (Corsi *et al.*, in press; Verhegge *et al.*, 2010). In 2010 and 2011, a mainly residential area was investigated west and southwest of the *forum* with GPR. The GPR surveys were conducted with a network comprising several single 500 MHz antennas. In 2010, an area of ~7600 m² was prospected with three antennas and a transect spacing of 0.25 m. Part of this area was investigated using a transect spacing of 0.05 m (Figure 1). For the July 2011 campaign southwest of the *forum*, an array of six antennas was employed; there the transect spacing was 0.05 m.

Processing included dewow, time zero alignment, gain and band-pass filtering (100 MHz-1 GHz). Spikes, caused by overhead power lines, were replaced by the mean of the two adjacent traces. Ringing from near-surface metal objects was removed by a band-reject filter (Verdonck *et al.,* 2012). Two- and three-dimensional phase-shift migration was used for imaging the data with 0.25 m and 0.05 cross-line spacing, respectively. The migration velocity was estimated by applying a 2-D *f-k* migration algorithm to single GPR profiles, using a range of constant velocities. For the 3-D data sets, migration-focusing tests were based both on profiles and time-slices. For the correction of the topography, several methods were applied: plane fitting (Streich and van der Kruk, 2006), topographic migration (Lehmann and Green, 2000) and 3-D topographic correction after migration (Leckebusch, 2007).

In contrast with the *forum,* with well-preserved, thick wall structures and organized according to a plan, similar to other towns in the Roman world, the interpretation of the residential areas was more complicated, for reasons which have been observed in other prospections of urban domestic areas (e.g., Benech, 2007). For example, there is a strong variation in the width and the state of preservation of the walls, and it can be difficult to distinguish walls, thresholds and drains. As a consequence, the delimitation of the different houses in an *insula* is often problematic, especially because of different building phases and alterations.

A peristyle house with a hypothetical extent of ~800 m² is located in *insula* XV. A large room, centrally located in the western wing of the house, probably is the *triclinium* (the most important reception and dining room; Figure 1, 1). The threshold of a wide door, opening to the peristyle is visible in the GPR data as an elongated, strong reflection with sharp edges (Figure 1, 2). In *insula* X, an alteration joined several units, which in an earlier phase seem to have been Independent. One of the original dwellings is characterized by a nearly symmetric house plan. In a later phase, a peristyle was constructed over this house (Figure 1, 3). Below a large room interpreted as the *triclinium* of the house after the alteration, there are vestiges of another house from the earlier phase. As for the smaller houses, several examples of a simple pattern, characterized by a courtyard ringed by a single layer of rooms, were detected within the 2010 and 2011 GPR survey areas. In other cases, it was more difficult to discern a regular house plan.

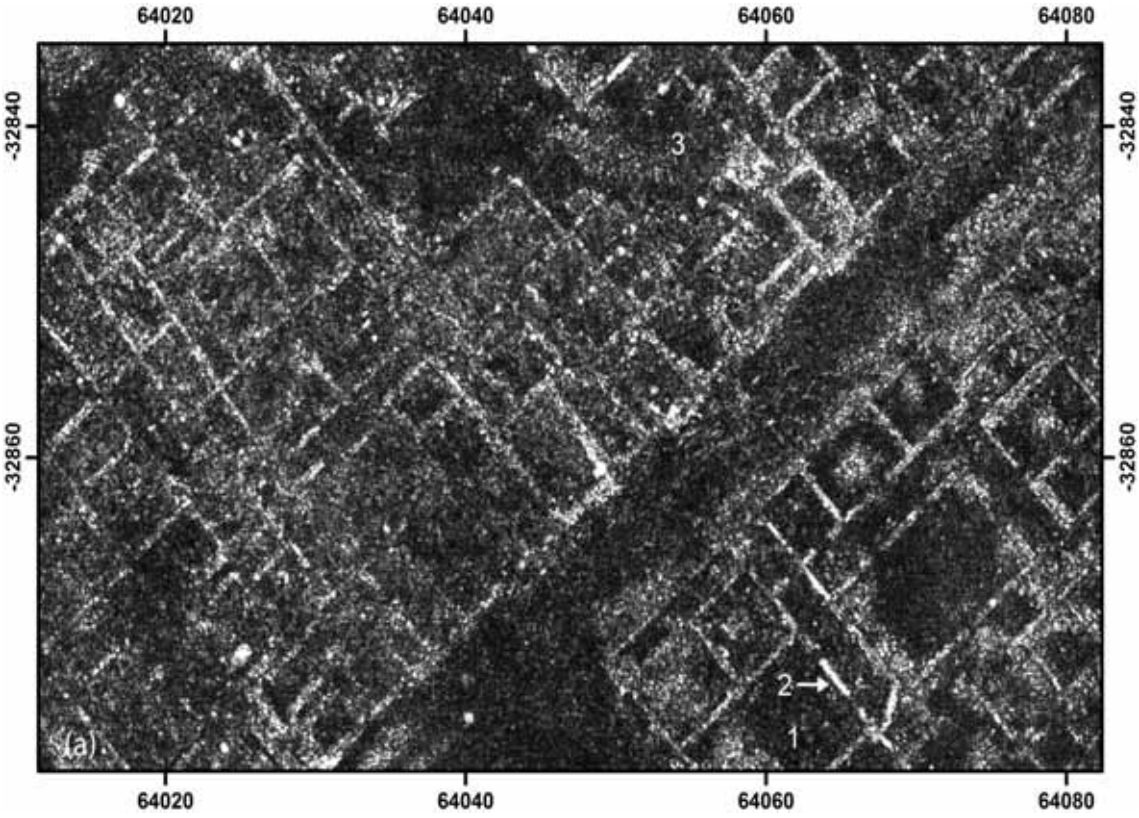

Figure 1: Part of the ~7600 m² area prospected with three antennas and a transect spacing of 0.25m which was investigated using a transect spacing of 0.05 m.

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MIRRORS AND VILLAS – HOW GEOPHYSICS IS REVEALING THE GAPING HOLES IN OUR KNOWLEDGE OF LATE IRON AGE AND ROMAN SETTLEMENT IN DORSET, UK.

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The area of modern Dorset corresponds roughly to the core of a Late Iron Age cultural group named the Durotriges. They are considered to be an enigmatic and loosely confederated group that retained their cultural identity of distinctive burial practices and uninscribed coinage well into the Roman period, disappearing as a distinct cultural grouping around AD120 (Papworth 2008). The process of Romanisation of the countryside appears to have progress in this area at a much reduced rate when compared with further east, and it was only in the very late 3rd century AD, some 250 years after the conquest, that high status buildings that can be classed as Romanised farmsteads and the more luxurious villas appear in the Dorset landscape.