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Delineation or Subsurface Voids at the Shi San Ling (13 Tombs), Hopeh Province, Peoples Republic or China, Using the Electrotelluric Method

Arnon Sugar and Michael R. Birkos, Geophysics International, 2901 Haymeadow, Carrollton, TX 75007.

Abstract

A relatively new electrotelluric (ET) surveying method was tested at the Ding Ling Tomb, Shi San Ling (13 Tombs) in Hopeh Province, Peoples Republic or China.

The ET method uses naturally occurring electromagnetic pulses that originate from planes of contrasting conductivity in the subsurface. The frequency Of these signals can be related to their depth Of origin by the skin-depth equation, as used in other telluric methods. Interpreting changes in the electrical field associated with these signals at the surface over a range of frequencies (depending on the depths Of interest) yields information on the depth and thickness Of subsurface resistivity anomalies. The tombs presented a discrete resistivity anomaly compared to the surrounding unstratified soil that encases them.

Two ET stations were read above known tomb areas, and one station was read outside the known tomb boundaries. The results revealed the presence Of a 7m high void at depths or 12m to 19m. This data was confirmed by measurement and projection of known tunnel and chamber dimensions and locations.

ET surveying is currently used commercially to detect man made and natural voids in coal and salt mines, and could be used to detect any archaeological feature that presents a subsurface resistivity anomaly.