



On the detection of adobe buried archaeological structures using multiscale remote sensing techniques : Piramide Naranja in Cahuachi (Peru)

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The detection of buried adobe structures is a crucial issue for the remote sensing (ground, aerial and satellite) applied to archaeology for the widespread of sun-dried earth as building material in several ancient civilizations in Central and Southern America, Middle East and North Africa.

Moreover it is complex, due to the subtle contrast existing between the archaeological features and the surrounding, especially in arid setting, as in the case of the well known Nazca Ceremonial Centre of Cahuachi, located in the desert of Nazca (Southern Peru).

During the last two decades of excavations adobe monuments dating back from the 6th century B.C. to the 4th century A.D have been highlighted by the Centro de Estudios Arqueológicos Precolombinos (CEAP), an Italian-Peruvian mission directed by Giuseppe Orefici. Actually, the archaeologists are excavating and restoring the core of the Ceremonial centre where is located a great pyramid (known as Gran Piramide). Beginning from 2007 the two institutes of CNR, IMAA and IBAM, have been involved by CEAP, in order to provide a scientific and technological support for the archaeological research.

Therefore, a multi-scale approach based on the integration of aerial and satellite remote sensing with geophysical techniques was employed in order to provide data useful for archaeological excavations. The abstract refers to the last investigations performed on a mound, known as "Piramide Naranja", during the 2008.

The processing of an aerial imagery time series and two QuickBird satellite images acquired in 2002 and 2005, allowed for identifying some features related to shallow and buried structures.

Such features were verified by means of geophysical prospections, performed by using the magnetometric method which observed changes in the magnetic field within the first few metres beneath the subsurface detecting buried walls and anomalies linked to ceramic deposits referable to possible tombs.

Finally, the integration of all data acquired by the different remote sensing techniques allowed for spatially characterizing the archaeological features, thus providing important information for the planning of the next archaeological campaign scheduled on July 2009