IGARSS 2000 ABSTRACT SUBMISSION TEMPLATE

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ABSTRACT TITLE:

Early Shang Civilization, Eastern China: A Challenging Application of Remote Sensing to Archaeology

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ABSTRACT TEXT:

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We are currently applying remote sensing data to study of ancient Shang civilization (ca. 2000-1500 BCE) in eastern China. This region is challenging for application of remote sensing but success in this environment would be encouraging. This paper is a preliminary report. The north China plain is subject to Yellow River floods. Repeated deposition of muds force abandonment of living sites and re-establishment elsewhere. Most sites are buried. The characteristic construction technique is "rammed earth", walls formed of pounded earth. A highly speculative notion is perhaps buried rammed earth walls have an interferometric signal resulting from differential expansion/contraction of clays in the soils related to the differing compaction of mud and rammed earth. We have acquired multiple sets of JERS data to test this hypothesis. The area also has both natural and agricultural vegetation cover. We are applying the new method of "forced invariance" to suppress the vegetation signal in Landsat thematic mapper image data to search for archaeological clues. Finally, areas of copper mineralization nearby will be mapped with Landsat data using the well known ability of such data to detect rock alteration. Ancient copper mines were known to support the needs of Shang civilization.