

# SEISMIC TOMOGRAPHY APPLIED TO ARCHAEOLOGICAL EXCAVATION: FIELD TESTS AT THE KIUIC SITE, YUCATAN, MEXICO

*William L. Fontaine, Millsaps College, Jackson, MS*  
*James B. Harris, Millsaps College, Jackson, MS*  
*George J. Bey, Millsaps College, Jackson, MS*

## Abstract

In June 2008, a seismic survey was conducted at the Kiuic archaeological site in the Central Hills District of southwest Yucatan, Mexico. The main target of the survey was a Maya temple pyramid (approximately 18 m x 16 m) consisting of two stepped platforms. A seismic tomography data set, yielding a total of 1320 raypaths through the structure, was acquired using a 12-channel engineering seismograph and a 1.8-kg sledgehammer source. The velocity structure of the pyramid was imaged through straight- and curved-ray tomographic analysis of compressional-wave first arrivals. Velocities range from ~400 m/s near the top of the pyramid to ~2400 m/s at bedrock. The bedrock velocity was confirmed by refraction analysis from a walk-away spread shot in an adjacent plaza. The final velocity model shows small high velocity anomalies at the top level of the pyramid, interpreted to be associated with concrete pads emplaced during stabilization of the upper walls, and a symmetrical low velocity zone (4 m x 6 m) on the back side of the structure near the base that will be tested by excavation in the summer of 2009. The results of this survey suggest that seismic tomography is a feasible noninvasive method for archaeological imaging.