



An evaluation of applicability of seismic refraction method in identifying shallow archaeological features A case study at archaeological site

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We applied the seismic refraction method at archaeological site, Tepe Damghani located in Sabzevar, NE of Iran, in order to determine the structures of archaeological interests. This pre-historical site has special conditions with respect to geographical location and geomorphological setting, so it is an urban archaeological site, and in recent years it has been used as an agricultural field. In spring and summer of 2012, the third season of archaeological excavation was carried out. Test trenches of excavations in this site revealed that cultural layers were often disturbed adversely due to human activities such as farming and road construction in recent years. Conditions of archaeological cultural layers in southern and eastern parts of Tepe are slightly better, for instance, in test trench $3 \times 3 \text{ m}^2$ 1S03, third test trench excavated in the southern part of Tepe, an adobe in situ architectural structure was discovered that likely belongs to cultural features of a complex with 5 graves. After conclusion of the third season of archaeological excavation, all of the test trenches were filled with the same soil of excavated test trenches. Seismic refraction method was applied with 12 channels of P geophones in three lines with a geophone interval of 0.5 meter and a 1.5 meter distance between profiles on test trench 1S03. The goal of this operation was evaluation of applicability of seismic method in identification of archaeological features, especially adobe wall structures.

Processing of seismic data was done with the seismic software, SiesImager.

Results were presented in the form of seismic section for every profile, so that identification of adobe wall structures was achieved hardly. This could be due to that adobe wall had been built with the same materials of the natural surrounding earth. Thus, there is a low contrast and it has an inappropriate effect on seismic processing and identifying of archaeological features. Hence the result could be that application of the seismic method in order to determine the archaeological features, having the same conditions, is not affordable and efficient in comparison to GPR or magnetic methods which yield more desirable results.