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Resistivity and Seismic Surface Wave Tomography Results for the Nevşehir Kale Region: Cappadocia, Turkey

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The Nevşehir Kale region located in the middle of Cappadocia with approximately cone shape is investigated for existence of an underground city using the geophysical methods of electrical resistivity and seismic surface wave tomography together. Underground cities are generally known to exist in Cappadocia. The current study has obtained important clues that there may be another one under the Nevşehir Kale region. Two-dimensional resistivity and seismic profiles approximately 4-km long surrounding the Nevşehir Kale are measured to determine the distribution of electrical resistivities and seismic velocities under the profiles. Several high resistivity anomalies with a depth range 8-20 m are discovered to associate with a systematic void structure beneath the region. Because of the high resolution resistivity measurement system currently employed we were able to isolate the void structure from the embedding structure. Low seismic velocity zones associated with the high resistivity depths are also discovered. Using three-dimensional visualization techniques we show the extension of the void structure under the measured profiles.