LATERAL VARIATION OF VELOCITY AND ATTENUATION STRUCTURE IN THE MIDDLE EAST FROM SURFACE WAVES AND *Lg* CODA

Lianli Cong, B.S.

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Rayleigh wave phase velocity, group velocity, and attenuation data were inverted for shear velocity and shear-wave Q (Q_μ) structure in the Middle East using two- and single-station methods. Results indicate that both velocity and Q_μ values vary regionally and with depth. At upper-mantle depths, shear velocities are roughly the same for different portions of the region. In the crust, shear velocities are highest in the Arabian Peninsula (Region 3), lowest in the Black Sea, the Caspian Sea, and adjacent areas (Region 2), and intermediate in the Turkish and Iranian Plateaus (Region 1). The average shear velocities for the uppermost 10 km are 3.21, 2.85, and 3.39 km/s for Regions 1, 2, and 3, respectively. Average Q_μ for the crust is 55, 75, 150 in Regions 1, 2, and 3, respectively. These values are much lower than those obtained for other regions in the world, but can be explained by high heat flow and recent tectonic activity in and around the Middle East.

High-frequency L_g coda attenuation was also used to investigate the efficiency of wave propagation. The stacked spectral ratio method was used to analyze the data, and a back-projection method was then employed to map the regional variations of L_g coda Q. The resulting tomographic map of L_g coda Q at 1 Hz (Q_0) shows a variation in the range 350-450 in the Arabian peninsula. These values are larger than those (150-300) found in the northern portion of the Middle East, where young faulting and deformation are currently

occurring. The lowest value of Q_0 occurs in west Anatolia where extremely high heat flow has been measured.