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The Scattering Attenuation of Seismic Wave In Southwest Anatolia

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The scattering attenuation in southwest (SW) Anatolia, which is a tectonically active region, is studied using the Multiple Lapse Time Window (MLTW) method on a lithosphere model. First the coda quality factor (Q_c) is estimated from the slope of coda wave amplitude decay. To determine the Q_c value the observed seismograms are Butterworth filtered for the centre frequencies of 0.75, 1.5, 3.0, 6.0 and 12.0 Hz. The slope of the coda wave amplitude decay gives the desired Q_c value. To calculate the scattered seismic energy against the source-receiver distance the MLTW technique utilizing three non-overlapping temporal data windows is applied where the scattering coefficient is assumed constant with depth. In SW Anatolia the scattering attenuation (Q_s^{-1}) higher than intrinsic attenuation (Q_i^{-1}) values for lower than 1 Hz frequency, while higher than 1 and 30 Hz frequency values, Q_i^{-1} values are lower than Q_s^{-1} values. Results show that intrinsic attenuation is dominant over scattering attenuation. Frequency dependence of S wave attenuation and anelastic attenuation are described by $Q_s^{-1} = 0.010 * f^{-1.508}$ and $Q_i^{-1} = 0.009 * f^{-1.17}$ respectively. According to the results of comparison, Q_i^{-1} and Q_s^{-1} values are low in SW Anatolia. These results indicate that SW Anatolia is tectonically active region.

Key words: Coda, MLTW technique, scattering attenuation and SW Anatolia.