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CRUSTAL ATTENUATION STRUCTURE IN MESSINA STRAITS AREA (SOUTHERN ITALY)

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Messina Straits has been studied in terms of coda waves attenuation using waveform recorded by seven seismic networks installed around the studied area. The magnitude of the selected earthquakes varies between 2.4 and 4.4 and their depth between 0.0 and 35 Km. For this study we used different techniques to obtain attenuation parameters using coda S-waves and P-waves pulse. Coda Q has been studied using the single scattering theory (Aki and Chouet 1975). As the earthquake analysis software we used MathCAD©2001i professional. The programs consist in two different routines (Del Pezzo author). The first produces the output values of the quality factor to different lapse time and the second allow to obtain a diagram that transfer the dependence between Q_c and frequency and lapse time, respectively. We used four frequency bands centred at 1.5, 3, 6 and 12 Hz. Q_c results show, for different frequencies and lapse time, an evident dependence on frequency and lapse time. In particular, the attenuation at higher frequency is less pronounced than at lower frequency and this dependence is usually correlated to the degree of tectonic complexity and heterogeneity of the region under study. Also, we note increasing Q_c with increasing lapse time. The comparison of different lapse time (40, 60 and 80 seconds) reveals that the Q_c values increase with the lengths. The results are in good agreement with previous results from this area (A. Godano et al. 1992) that observed an increasing trend of the mean value of coda Q with the increasing window length. This observation has been interpreted as due to the increase of Q_c with depth. Finally, we determined the quality factor for P-wave (Q_P) in the time domain, using the pulse broadening method. The measure of the pulse width is defined as the duration between the first break and the first zero crossing of the seismic signal (O'Neill and Healy, 1973). Since the pulses width can not vary with the magnitude to extract path-broadening effects, we selected earthquakes with a mag-

nitude between 2.2 and 3.4. Using the relation between the pulse width and distance given by Stacey et al. (1975), and assuming a homogeneous media with a P-wave velocity equal to 5.1 km/s, we estimated the quality factor Q_P for hipocentral distances lower than 150 km. We obtained an extremely high attenuation for the P-waves, which can be explained with the high tectonic complexity present in this region.