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Analysis of Tide Gauge Data for the 21 May 2003 Tsunami in the Mediterranean Sea

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On May 21, 2003 a moderate tsunami was generated in the Mediterranean Sea due to an Mw 6.8– 7 earthquake off the northern coast of Algeria. The tsunami reached a maximum run-up height of about 2 m along some coastal areas of the northwestern Mediterranean Sea, but in general was less than 1 m. Tide gauge data recorded during the 2003 tsunami event within the western Mediterranean were studied. The tidal components are removed from the tide gauge data before carrying out the Fourier transform and time-frequency (wavelet) analysis. The results indicate that the sea level signals generated by the tsunami had different characteristics at each tide gauge. In some tide gauges the signal died out quickly while in other the signal persisted for more than one day. For some tide gauges several wave trains having a period of about 6 hours was observed. This can be partly attributed to the closed nature of the Mediterranean basin which can significantly intensify the effect of reflection of tsunami waves and cause signal resonance. The first tsunami wave manifested itself as a leading elevation wave in some tide gauges while it was a depression one in some others further highlighting the complex behavior of tsunami propagation in the region.