



The 24 September 2013 tsunami in the Makran region, northwestern Indian Ocean

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Tsunami waves were observed in the northwestern Indian Ocean following the Mw 7.7 Pakistan inland earthquake on 24 September 2013. We study this tsunami using sea level data analysis along with numerical modeling of tsunami. Our tsunami waveforms include 11 tide gauge and one DART records. Spectral analysis showed that the most governing period of the tsunami waves was around 12 min though wavelet analysis showed that parts of the tsunami energy were partitioned into other period bands of 7 and 16 min. The tsunami registered a maximum wave height of 109 cm in Qurayat tide gauge station (Oman). Distribution of aftershocks in the region showed that all of them were located inland indicating that the tsunami was generated by submarine geological phenomena triggered by the earthquake. Tsunami modeling assuming a pile-up structure at the location of the new island was not successful in reproducing the observed sea level records. A landslide source with a length of about 15-20 km, a thickness of 100-150 m located at 61.72 E and 24.60 N seems capable of fairly reproducing the observed sea level records.