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Distribution of runup heights of the December 26, 2004 Tsunami in the Indian Ocean

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A massive earthquake with moment magnitude 9.3 occurred on December 26, 2004 off the west coast of northern Sumatra (Indonesia) generated huge tsunami waves affected many coastal countries in the Indian Ocean and also recorded in the Atlantic and Pacific Oceans. A number of field surveys in the basin of the Indian Ocean have been performed after this tsunami event; in particular, several surveys in the south/east coast of India, Andaman and Nicobar Islands, Sri Lanka, Sumatra, Malaysia, and the Andaman coast of Thailand have been organized by the Korean Society of Coastal and Ocean Engineers from January so far up to August 2005. Spatial distribution of the tsunami runup along the coasts of the Indian Ocean obtained by various expert groups is summarized in this article. They are used to analyze the distribution function of the wave heights on different coasts. Theoretical interpretation of this distribution is associated with random coastal topography and bathymetry and coastline led to the log-normal functions. Here we show that observed data are in a very good agreement with log-normal distribution confirming the important role of the variable coastal ocean bathymetry in the formation of the irregular wave height distribution along the coasts.