S. Brune, S. Ladage, A.Y. Babeyko, C. Müller, H. Kopp, S.V. Sobolev (nur Kopp ist von IFM-GEOMAR)

Submarine slope failures at the eastern Sunda Arc - Bathymetry analysis and tsunami modeling

Tsunamis pose a major threat to coastal communities in Indonesia. Although most tsunamis are generated by underwater earthquakes, submarine slope failures can be responsible for localized high-amplitude tsunamis as well. We analyze bathymetric data collected by RV Sonne at the eastern Sunda Margin between central Java and Sumba Island. We present six submarine landslides with volumes ranging between 1 km“ in the Java fore-arc basin up to 20 km“ at the trench off Sumba. Generated tsunamis are computed by means of numerical modeling which results in run-up of roughly 7 m at Sumba and Sumbawa. Four slides are situated remarkably close to the epicenter of the 1977 tsunamigenic Sumba Mw = 8.3 earthquake. Comparing documented tsunami run-up heights and arrival times with our modeling results, we discuss the hypothesis that one or more of these slides were triggered by the 1977 earthquake.

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