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A new possible tectonic source for the Messina tsunami of 1908?

Mohammad Heidarzadeh (1), Lili Fu (1), Felix Gross (1), Francesco Chiocci (2,3), Domenico Ridente (3), and Sebastian Krastel (1)

(1) Christian Albrechts University of Kiel, Institute of Geosciences, Kiel, Germany (mohammad_heidarzadeh@yahoo.com), (2) Sapienza University of Rome, Rome, Italy, (3) IGAG-CNR, National Research Council, Rome, Italy

We present the results of a new seismic survey and numerical modeling to contribute to the discussions on the source of the Messina tsunami of 1908. After a century of controversies about the source of this important tsunami, neither the exact source of the earthquake nor the tectonic- or landslide-genesis of the tsunami are well understood. Landslides in the southern part of the Messina Straits were proposed as possible trigger for the tsunami but they have to be dismissed on the basis of high resolution seismic and modern multi-beam data. A recently-conducted seismic survey identified a set of normal faults with a length of 10-30 km trending east-west. Seismic profiles show that these faults are located at a depth of 1-10 km with an average dip angle of around 84degrees and a slip of around 10 m. Numerical modeling of tsunami using these faults as the tsunami source showed that they are fairly capable of reproducing the observed runup heights of up to 9m, measured following the 1908 earthquake along the Sicilia and Calabria coast. The tsunami modeling based on this new tectonic source implies a moment magnitude of around 7.5 for this earthquake, which is slightly larger than the available estimates based on macro-seismic data.