



26th December 2004 Great Sumatra Earthquake: first insights from the summer 2005 Marion Dufresne cruise

J.-C. Sibuet (1), C. Rangin (2), S. Singh (3), A. Cattaneo (1), D. Graindorge (4), F. Klingelhoefer (1), J. Malod (4), J.-L. Schneider (5), N. Sultan(1), M. Umber (1) and the Sumatra aftershocks team

(1) Department of Marine geosciences, Ifremer, Brest, France, (2) Collège de France, Aix en Provence, France, (3) Dep. Marine Geosciences, IPGP, Paris, France, (4) UMR Domaines Océaniques, IUEM/UBO, Brest, France, (5) Dep. geology and oceanography, University of Bordeaux, France

During the "Sumatra Aftershocks" cruise (July/August 2005) we carried out a complete swath-bathymetric survey in a 370*75 km stripe located between northern Sumatra and the Indonesia/India boundary and from the trench to northeast of the Sumatra fault. 20 OBSs were deployed in the area and recorded about 2000 earthquakes during that period. Coring, heat-flow and piezometer measurements were also carried out.

Between the trench and the backstop located southwest of the Aceh forearc basin, numerous trench parallel piggy back basins were mapped. On the basis of morphology, coring and heat flow measurements, a major active thrust fault, which might correspond to an active splay fault, was identified southwest of the Aceh forearc basin. The identification of a minor pull-apart basin along its trend might suggest the presence of a small strike-slip component in the past. In addition, we have demonstrated that 1) close to the trench, the slab was essentially inactive (no significant active tectonic features and presence of minor recent land slides); 2) the southwestern Aceh basin boundary was inactive; 3) the Sumatra fault and its offshore prolongation was also inactive suggesting that no faults were significantly active northeast of the backstop.

In conclusion, the co-seismic motion was probably partitioned between a major splay fault located just southwest of the backstop and other potential splay faults located within the piggy back basins, between this feature and the trench.