Auxiliary Material

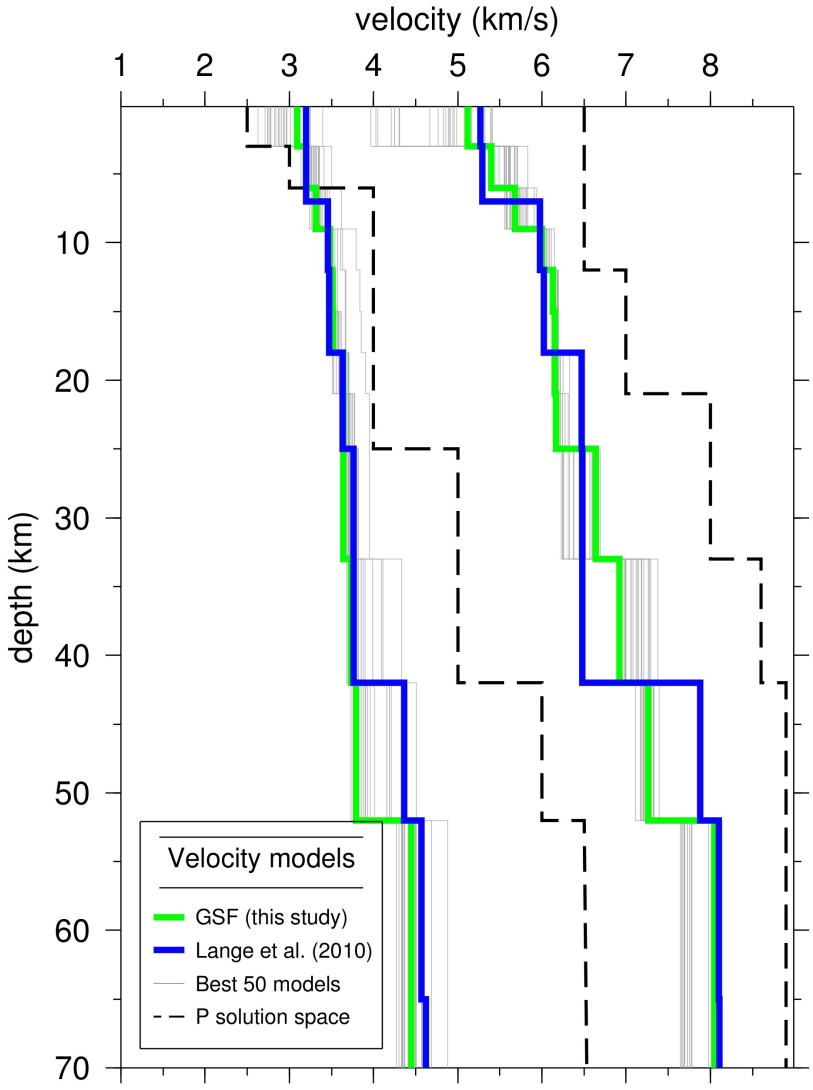

Figure S1: The minimum 1-D velocity model (green line) with the lowest RMS from the vp/vs inversion using stations with at least 8 P and 4 S arrivals with GAP≤180° and 428 well constrained crustal events (<20 km) along the Sumatran Fault with 6,565 P- and 4,440 S-wave travel time observations. The range of input P models is indicated by the two dashed lines. The grey lines show the output models from the inversion using different vp/vs ratios between 1.5 and 2.1 that fit the data equally well. The velocity model from *Lange et al.* (2010) derived from the whole network (events from the SF and Wadati-Benioff zone) is shown in blue for comparison.

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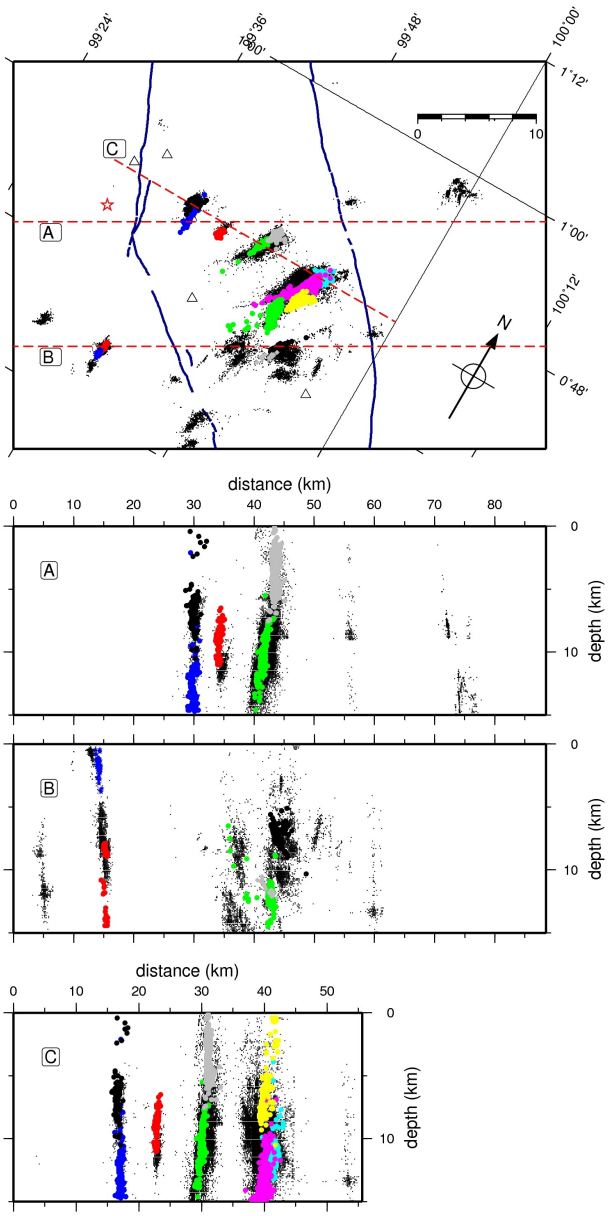

12 **Figure S2:** Results of jackknife test. The plot shows the hypocentres from 500 jackknife test
13 (black dots). First, between 15 and 30% of the picks were randomly ignored. Then, the events
14 were relocated with VELEST [*Kissling et al.*, 1994] and finally located with hypoDD.
15 Superimposed in colour are the hypocentre locations from individual events (which had more
16 than 10 hypocentre locations after the 500 jackknife tests) in different depth ranges. Resulting
17 standard derivations are 750 m for the horizontals and 1250 m in depth.

References

Kissling, E., W.L. Ellsworth, D. Eberhart-Phillips, U. Kradolfer, 1994: Initial reference models in local earthquake tomography, J. Geophys. Res., 99(10), 19.635-19.646.

Lange, D., F. Tilmann, A. Rietbrock, R. Collings , D. H. Natawidjaja, B. W. Suwargadi, P. Barton, T. Henstock, T. Ryberg, 2010. The Fine Structure of the Subducted Investigator Ridge in Western Sumatra as Seen by Local Seismicity, Earth and Planetary Science Letters, 298(1-2), doi:10.1016/j.epsl.2010.07.020.