



Kinematics and Source Zone Properties of the 2004 Sumatra-Andaman Earthquake and Tsunami: Nonlinear Joint Inversion of Tide-Gage, Satellite Altimetry and GPS data

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We (re)analyzed the causative source of the 26 December 2004 Sumatra-Andaman earthquake and tsunami. We performed nonlinear joint inversion of an in-homogeneous dataset made up of tide-gages, satellite altimetry, and far-field GPS recordings. The purpose is two-fold: (1) the retrieval of the main kinematics rupture parameters (slip, rake, rupture velocity), and (2) the inference of the rigidity of the source zone. Our results confirm the source of the 2004 Sumatra-Andaman earthquake is complex as constituted by three main slip patches, with peaks of slip of 30 meters. The rake rotates counter-clockwise at North. Our source model features a rigidity (20-30 GPa) that is lower than the Preliminary Reference Earth Model [Dziewonski and Anderson, 1981], and the rupture velocity is lower (2 km/s) for the shallower than for deeper part (3.25 km/s) of the source, and lower (2 km/sec) in the deep Northern part of the source.