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How much has the 2004 Sumatra, Indonesian, earthquake changed the Earth's rotation and gravity field?

B. F. Chao (1), and R. S. Gross (2)

(1) Space Geodesy Laboratory, NASA Goddard Space Flight Center, Greenbelt, Maryland 20771, USA. (2) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, USA

On a time scale shorter than an hour, a seismic event, apart from the "shaking" that is the earthquake, leaves behind permanent dislocations in the Earth. This redistribution of mass changes the Earth's inertia tensor and hence its rotation (in both length-of-day LOD and polar motion) under the conservation of angular momentum, and the gravity field according to Newton's gravitational law. The question is whether these effects are large enough to be detectable. In the past we have calculated these effects, based on the formulation by Chao & Gross (1987), for over 21,600 major earthquakes that have happened since 1977 as given in the Harvard Central Moment Tensor catalog. They individually were all found to be too small to have left any discernible signature in geodetic records of Earth rotation or global gravity field. So how large are the effects produced by the recent Sumatra earthquake, the fourth largest in a century? Our calculation results in the following for the co-seismic changes: (1) LOD decreased by 2.68 μs. (2) Mean North Pole was shifted by about 2.5 cm in the direction of ~145°E. The latter is remarkably continuing the past co-seismic cumulative trend. (3) Earth's oblateness J2 decreased by 0.90 e-11, continuing the past co-seismic trend in making the Earth less oblate. Compared to today's space geodetic detectibility level, we conclude that the Sumatra earthquake has caused a LOD change too small to detect, an oblateness change barely detectable, and a pole shift large enough to be possibly identified in the observation. An outstanding quest for several decades, the latter is very interesting but will require careful scrutiny in sifting through various other signals that are present and larger.