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Global seismicity and the rotation of the Earth (considering the possible influence of the M=9 Indian Ocean earthquake on 26 December 2004)

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The relationship between the length of day (LOD), polar motion (PM) and the earthquake activity is discussed. With the use of the results of theoretical model calculations based on the stress load acting on and within the elastic Earth and observed time series of these geodynamical phenomena, it is shown that a single seismic event - even the greatest one - is not able to influence in a perceptible degree the Earth rotation vector. It is demonstrated in the case of LOD that it has certain correlation with the temporal distribution of the planetary seismicity, and most likely the irregularities in axial rotation speed influencing to some extent the time-variations of the seismicity. The radial component of PM even in the most extreme earthquakes do not exceed 4-5 milliarcseconds. It is difficult to detect such a small PM excitation.

An application of the above mentioned theoretical model to the case of the giant seismic event of 26 December 2004 shows that it can produce variations in LOD of about 5 to 8 microseconds which do not exceed the current accuracy of observations (10-20 microseconds). In dependence of the measure of the scale of the deformed by stress accumulation area (about $10^4 \mathrm{km}^2$) the magnitude of the PM might be in the range of 1 to 2 milliarcseconds.