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# Theory and case studies on solar induced seismicity

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Huge electric current vortices are continuously generated in the Earth's lithosphere through electromagnetic induction from powerful ionospheric electric vortex currents that arise from ionization on the sun-lit side of the Earth (Chapman S. and Bartels J., 1940). The circular telluric currents in the Earth's lithosphere interact with the Earth's main magnetic field (H), building up a magnetic moment (M). According to T = [M x H] a mechanic torque (T) results from this interaction that can reach values as high as 5x10exp13 Nm (Duma G. and Ruzhin Y., 2003).

We present evidence that this ionospherically induced telluric torque, which reaches deep into the lithosphere, influences the diurnal seismicity patterns in major earthquake zones as documented by earthquakes with magnitudes $M \geq 6.0$. Our results confirm observations of distinct time-of-day patterns of seismic activity reported for over a century (Omori F., 1902; Conrad V., 1932 ; Shimshoni M., 1971; Duma G. and Vilardo G., 1998; Schekotov A.Yu., Molchanov O.A. and Hayakawa M., 2005) and even much earlier by Pliny the Elder, 79 A.D. A solar influence on earthquake frequency is apparent not only in diurnal patterns, but also in seasonal (e.g. Lipovics T., 2005) and decadal patterns.

The effect can be validated by data recorded continuously at geomagnetic observatories, the INTERMAGNET stations (http://www.intermagnet.org), operating on all continents. The observatories continuously record magnetic variations which arise from the telluric currents in the Earth's lithosphere.

Theory and model are presented, starting from the primary source for the effect, which is the varying solar wind speed as measured by satellites. The data are provided by the OMNI 2 directory (NASA, http://omniweb.gsfc.nasa.gov). We offer 7 case studies that deal with seismic activity patterns in the diurnal, seasonal and long term time domains for seismic zones in Asia (Japan, Taiwan, Sumatra), N-America (California), the Mid Atlantic Ridge, the Red Sea and Europe (Austria).