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Statistical indication of a coupling between solar induced influences and radon degassing in the Dead Sea area

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We investigate cyclic signals in a time series of radon gas, a tracer for fluid flow and degassing processes. Naturally degassing radon is being monitored continuously since 2000 in a thermal spring in Tiberias, Israel. Together with radon the variables: air pressure, air temperature, rain, lake level, local earthquakes, solar flux (10.7) and the Z-component of the Earth's magnetic field at the station Qsaybeh are analysed. The time series are decomposed in seasonal, multiday and daily variation and a moving window frequency analysis (sliding spectra) is calculated. The following results are presented: The variance of multiday variation of radon as well as the amplitudes of 27-days-, and 42-days-period of radon show a correlation with solar flux and magnetic field. A signal of the “fastest interplanetary shock” on 29.10.2003 is identified in sliding spectra of radon. Within a local seismically quiet time interval (1.1.2005 -14.9.2005) the multiday variations of solar flux, water temperature and radon show a significant relation. Additionally they have similar peaks for the 27-days period in the spectra. This indicates the existence of solar induced physical processes, which influence radon degassing and seismicity globally.

Bitte beachten Sie auch das parallele Poster: “Nonstationarities in multiday variation of radon degassing and seismicity in the Dead Sea area”.