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Statistical indication of solar induced influences on radon variations at a hot spring in the Dead Sea area

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Naturally degassing radon, a tracer for fluid flow and degassing processes, has been monitored continuously since 2000 in a thermal spring in Tiberias, Israel. The cyclic signals in the resulting time series have been investigated together with air pressure, air temperature, rain, lake level, solar flux, and the Z-component of the Earth's magnetic field at two stations in Lebanon and Italy. The time series were decomposed in seasonal, multiday and daily variations and a moving window frequency analysis (sliding spectra) was performed. After the "fastest measured interplanetary shock" on 29.10.2003, the variance of the multiday variation (VMV) of radon increased by a factor of 4. The VMV of radon, solar flux, and the magnetic field Z-component, as well as the amplitudes of the 27-day-period of radon and the magnetic field Z-component, are correlated after summer/autumn 2003. This indicates the existence of solar induced physical processes, that influence radon degassing and fluid flow within a border fault of the Dead Sea Rift system.