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## Spectral-decomposition techniques for the identification of radon anomalies temporally associated with earthquakes occurring in the UK 2002 and 2008

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**Abstract.** During the second half of 2002, the University of Northampton Radon Research Group operated two continuous hourly-sampling radon detectors 2.25 km apart in the English East Midlands. This period included the Dudley earthquake ( $M_L=5$ , 22 September 2002). Also, at various periods during 2008 the Group has operated other pairs of continuous hourly-sampling radon detectors similar distances apart in the same region. One such period included the Market Rasen earthquake ( $M_L=3$ , 27 February 2008).

Windowed cross-correlation of the paired time-series was used to identify simultaneous short-duration anomalies. In the 2002 data, only two of significant cross-correlation were observed, each corresponding temporally to a UK earthquake, one to the Dudley earthquake and other to a smaller earthquake in the English Channel ( $M_L=3$ , 26 August 2002). In the 2008 data, cross-correlation initially revealed little evidence of simultaneous short-duration anomalies but cross-correlation of the noised and de-trended using Empirical Mode Decomposition (EMD) revealed clear simultaneous short-duration anomalies which correspond temporally to the Market Rasen earthquake.

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