

Rotational Earthquake Motions Observed in the UK

R.M.W. Musson and S.L. Sargeant

*British Geological Survey
Murchison House, West Mains Road, Edinburgh EH9 3LA, UK.*

ABSTRACT

The experience of the UK with regard to earthquake damage is somewhat unusual, in that the highest intensities observed historically have often not been from the largest earthquakes. The most damaging earthquake in the last 400 years, the 1884 Colchester earthquake, owed its impact more to its shallow depth (about 3 km) than to its magnitude (4.7 ML). No onshore earthquake in the UK has exceeded 5.4 ML in magnitude (larger ones have been observed offshore).

Nevertheless, in a number of instances of damaging historical earthquakes, there is clear evidence in the written accounts of rotational effects. This was particularly noted in the 1816 Inverness earthquake, in which the top of the spire of the town jail was twisted “several inches” (~ 10 cm) from E to NW. Twisting of damaged chimneys was reported in connection with the 1884 Colchester earthquake, and also observed recently in the Folkestone earthquake of 28 April 2007 (4.3 ML), in which rotation of architectural ornaments was observed at the Grace Chapel, Folkestone. These accounts demonstrate that rotational effects are not confined to large magnitude earthquakes.