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Towards an Improved Catalog of Irish Seismicity in the years 2010 to 2015

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Ireland has traditionally been categorised as a region of very low seismicity. However, the low number of permanent seismic stations across Ireland may have contributed to this viewpoint. Since 2010, seismic station coverage across Ireland has dramatically improved with the establishment of the Irish National Seismic Network (INSN), and the deployment of the Ireland Array (IA) and University College Dublin (UCD) temporary seismic networks. The INSN has produced a catalog of seismic events from 2010 to 2015, of which the vast majority are suspected to be quarry/mine blasts. Discrimination between natural and man-made seismic events represents a major challenge for seismological observatories, particularly in regions of low seismicity. Previously, the factors used by the INSN to discriminate between naturally occurring earthquakes and quarry/mine blasts were location and origin time. With the inclusion of the IA and UCD data, it now becomes possible to precisely relocate these events, compare their location with known quarry/mine sites and thus identify groups of events having occurred in the same quarry/mine. In this work, we attempt to develop a new tool for discrimination based on waveform cross-correlation to identify repeating quarry blasts. Once man-made seismic events have been excluded, we are left with a more accurate view of the natural Irish seismicity rate for the period 2010-2015.