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# Moho depth and crustal anisotropy in Ireland from teleseismic receiver functions

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The Iapetus Ocean closure during the Caledonian Orogeny in the Paleozoic led to a multi-phase continental collision between different paleocontinents in the North Atlantic region. It is believed that evidence of these past geological events could be preserved in the fabric of the Ireland's crust and upper mantle, especially across the Iapetus Suture Zone which cuts through the island with a NE-SW trend.

In the framework of the SIM-CRUST project, we studied this open matter through the use of classical teleseismic receiver function (RF) method, in order to map Ireland's Moho depth and highlight intra-crustal seismic discontinuities. Moreover, thanks to the recently developed RF harmonic decomposition technique, the presence of crustal anisotropy has been investigated analysing the changes in the amplitudes of the P-to-S converted phases as a function of backazimuth.

In this study, we analysed teleseismic records from about 40 broadband seismic stations deployed across Ireland in the last decade. We used data from both permanent (Irish National Seismic Network , INSN) and temporary (Ireland Array, IA; Irish Seismic Lithospheric Experiment, ISLE; and Irish Seismological Upper Mantle Experiment, ISUME) stations, with a recording period of minimum two years. This represents a suitable data-set for RF studies and for the harmonic decomposition technique, providing a full range of backazimuth and a uniform coverage of Ireland.

Preliminary results from RF analysis show strong consistency of signals from the different stations, with a clear signal of the P-to-S converted phase generated from an almost flat Moho, arriving around 4s after the direct P pulse. We also observed an intra-crustal positive pulse that matches what previously described by others authors. Finally, thanks to the harmonic decomposition analysis some anisotropic features have been found in the upper and lower crust. These results give a new insight into Ireland's lithospheric structure and evolution in the context of regional geodynamics.