Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03228, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03228
EGU General Assembly 2008

Joint inversion of seismic and gravity data onshore Ireland

J.P. O'Donnell (1), E. Daly (1), C. Tiberi (2), P.W. Readman (3), B.M. O'Reilly (3), F. Hauser (3)

(1) Dept. of Earth and Ocean Sciences, National University of Ireland, Galway, Ireland (j.odonnell6@nuigalway.ie), (2) Laboratoire de Tectonique-CNRS/UMR 7072, Universite Pierre et Marie Curie-Paris 6, France, (3) Geophysics section, School of Cosmic Physics, Dublin Institute for Advanced Studies, Ireland

The Irish Seismic Lithospheric Experiment (ISLE) was designed to investigate the lithospheric structure across the late-Caledonian Iapetus Suture in SW Ireland using broadband seismological techniques. The experiment was a joint venture between the Dublin Institute for Advanced Studies and Geophysical Institute Karlsruhe. Results indicated a greater depth to moho north of the suture zone than south, and sub-crustal anisotropy suggested by the failure of crustal anisotropy to explain the large apparent delay times observed in teleseismic shear-wave splitting measurements. The ISLE network consisted of 31 seismic stations laid out predominantly perpendicular to the proposed suture zone, in conjunction with the 5 permanent stations of the Irish Seismic Network. The teleseismic data set used in our study consists of 1936 P/PKPdf traveltime residuals derived from 276 events, recorded over a three year period from September 2003. Analysis indicates a change from faster to slower arrivals in moving from north to south across the suture zone, with a variation of the order of 1 sec. We jointly invert the residuals with the complete Bouguer gravity anomaly to analyse the lithospheric structure across the suture zone. A preliminary 3D P wave velocity model will be presented along with synthetic tests.