Scaling source properties of the earthquake sequence triggered on 22 November 2014 in the South-Eastern Carpathians foredeep area (Romania)

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The purpose of the paper is to investigate the earthquake sequence generated in the foredeep region of the South-Eastern Carpathians, in Romania, at the end of 2014. This region is generally characterized by diffuse seismicity with some alignments oriented either parallel to the Carpathians Arc or perpendicularly. It is likely that this crustal seismicity is connected to some extent with the strong cluster of subcrustal earthquakes in the Vrancea region. The study sequence started with the main shock on 22 November 2014, 19:14 (45.860N, 27.160E, h = 39 km, ML = 5.7). The sequence main shock is the greatest instrumentally recorded earthquake produced in this area. The aftershocks (around 200) were unusually small as compared with the main shock. The largest aftershocks were recorded on 7 December 2015 (ML = 4.4) and 19 January 2015 (ML = 3.8). Most of the aftershocks had magnitude below 2.

We apply cross-correlation analysis together with empirical Green's function deconvolution and spectral ratios techniques to optimise the source parameters determination. Groups of main events and associated co-located aftershocks which are eligible as empirical Green's functions are investigated to this aim. At the same time we applied inversion techniques to retrieve the moment tensor solution for the largest shocks. The source parameters are estimated as mean values for all the available earthquake pairs. Source scaling properties and focal mechanism are investigated and discussed in terms of the regional seismotectonics and comparatively with the source scaling relationships for the Vrancea intermediate-depth earthquakes.