



GPS Observations and 3-D Postseismic Crustal Displacements in the Vrancea Region, Romania

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The Vrancea region in the South-East Carpathians of Romania is a seismically active area. The tectonic processes responsible for the earthquakes in this region are not uniquely identified yet. GPS campaigns of 3-D crustal displacements in this region, performed by ISES (Netherlands) in collaboration with SFB-461 (Germany) and the National Institute for Earth Physics and the University of Bucharest (Romania), are expected to assist in solving this issue. Measurements have been performed in this area since 1995 and the current GPS network consists of more than 50 campaign points and six permanent GPS stations.

Ongoing deformation related to the large ($M_w > 7$) earthquakes that struck the Vrancea region in 1977, 1986 and 1990 could have a contribution to the GPS-observed displacement rates. This so-called postseismic deformation results from viscoelastic relaxation of crustal and shallow upper-mantle low-viscosity zones due to the redistributed stress and strain after faulting. Whether the postseismic contribution to the observed 3-D displacement rates is negligible or not depends strongly on the rheological properties of the shallow earth layers in the region.

We numerically determine 3-D postseismic displacement rates for various earth models and compare these rates with the horizontal and vertical GPS displacement rates that include the latest campaigns. The earth models as used in our simulations will be critically examined.