



## **Measurement of radon emanation along three surface faults from Dobrogea (Eastern – Romania)**

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Many investigations have revealed the anomalous radon emanation out of the lithosphere before and after large earthquakes. In the last years we have started, in collaboration with National Institute for Earth Physics, R&D National Institute for Metals and Radioactive Resources from Bucharest and the University of Ioanina Greece (bilateral Research project 2006-2007) a series of Rn measurements in soil along the active surface faults in Greece and Romania.

The sites investigated in this paper, with the mobile monitoring station, are in the vicinity of three transcrustal faults situated in the Eastern part of Romania, in the seismogenic region called Dobrogea. Only moderate-size events are observed ( $M_w \leq 5.3$ ) clustered especially along Sfantul Gheorghe fault. The maximum observed magnitude for this crustal seismic zone is  $M_w = 5.3$ , assigned to the event occurred on February 11, 1871. The seismic activity rate of this zone is 0.360254. The fault plane solutions reflect the existence of the extensional regime of the deformation field. The rate of the seismic moment release is  $M_o = 1.8 \times 10^{15}$  Nm/year. The limit of the Moessian Platform with the North Dobrogean Orogen is called the Peceneaga-Camena fault. It is considered a transcrustal fault, and has an aparent transcrustal movement with a senestrum compressional behaviour. The Dobrogean Sector was separated by Capidava-Ovidiu fault in two parts, Southern Dobrogea and Central Dobrogea.

The measurements were performed in 3 profiles perpendicular on the fault lines at a distance between 10-200 m. The distance between two profiles was between 0,5 and 8 km. The measurements evidenced volumetric Rn activity in the profile between  $24 - 4,3 \times 10^3$  Bq/m<sup>3</sup>. The highest values are detected on the top of the faults profile. The monitoring station was transported along a region where radon gas is released along the fault into atmosphere. The Rn monitoring instrument used for this application was RAD7 with silicium semiconductor detector, microprocessor for count memory and displaying facilities

We have observed the increase of radon content in the vicinity of all three studied faults and have associated the anomalous radon emanation with the damage process in the crust. Even if during the monitoring period we had no significant earthquake to predict, the simple fact, that we could outline the faults was a success of our study and a very useful tool for hazard assessment in the region.