IRON: Italian Radon mOnitoring Network

gaia soldati, valentina cannelli, andrea antonioli, massimiliano ascani, simone atzori, mariagrazia ciaccio, gianfilippo deastis, gianfranco galli, daniele melini, adriano nardi, andrea serratore, and antonio piersanti
INGV, Roma, Italy (gaia.soldati@ingv.it)

We present the Italian Radon mOnitoring Network (IRON): a new nationwide permanent network for near real-time measurements of soil radon emissions in Italy. Deployed over the last 10 years, presently IRON consists of over 50 stations mainly concentrated in the Central- Southern Apennines, mostly following the distribution of Italian seismicity, but marginally covering the whole Italian peninsula. At present, most IRON stations have recorded radon concentration time series for more than 4-5 years. With a standard sampling interval of about two hours, the whole IRON dataset consists of nearly 440,000 single radon concentration measurements. The network is described in terms of sites, installation types and collected time series. A specifically designed relational database, IRON-DB, hosted on a virtual server platform operated by the INGV IT services, allows access to all the collected data, as well as instrumentations and different type of installations. The amount of data, together with the systematic methods of measurements, allowed us to evaluate some significant aspects related both to the measurement methodology and to the complex dynamics of soil radon emanations. We discuss the potential of IRON as a tool to study the relation between radon variability and the preparation process of strong earthquakes.