

Relation Between Spring Water Radon Anomalies and Seismic Activity in Garhwal Himalaya

Rakesh Chand RAMOLA

Department of Physics, Hemwati Nandan Bahuguna Garhwal University,
Tehri Garhwal, India, e-mail: rcramola@gmail.com

A b s t r a c t

The variations of spring water radon concentration and meteorological parameters were analysed in relation to the seismic activities in Garhwal Himalaya, India. The radon anomalies were classified on the basis of statistical treatment of the daily observations. The precise measurements of water discharge rate from the spring have been made along with radon measurements for earthquake precursory study. The earthquakes with epicentral distances less than 150 km were considered by an empirical relationship. Pre-, co-, and post-seismic changes in the radon concentration were taken carefully into account in the empirical relationship to establish this behaviour as a potential earthquake precursor. The empirical relationship has been validated by the radon data recorded from the spring waters. The magnitudes of the earthquakes were estimated by using the empirical relationship by introducing computed correlation coefficient of radon and meteorological parameters. The calculated magnitude of some local earthquakes matches exactly with the magnitude recorded by the laboratory seismograph. The possible mechanisms that may cause a radon anomaly are also discussed.

Key words: radon anomaly, FFT, stress, seismic activity, earthquake magnitude.