Measuring radon and other environmental parameters as earthquake precursors

Since earthquakes are natural physical phenomena, the techniques used in order to predict whether an earthquake is approaching are based on geophysical data, seismic data, magnetic fields, electric fields and geodetic data. Different types of gas in the earth subsurface exhale from active faults and deep geodynamic processes: they can produce anomalies, i.e. a sudden change of the characteristics of the observed time series, emissions, changes in temperature and water levels, electrical conductivity, and more. In general, all the anomalies, observable before an earthquake, could be useful for a better understanding of seismic precursors [1]. Radon (Rn222), in particular is recognized as a precursor of earthquakes. It is a radioactive and inert gas generated by the radioactive decay of Radium (Ra226) in the decay chain of Uranium (U238) [2]. Variations of Radon concentration, both in water and in the ground, associated to seismic activity, are well known since more than half a century. To this date, no reliable method has been developed for the successful application of earthquake prediction, based on a human scale. Nevertheless, based on long-term studies, some earthquake precursors, are subject to so many different influences that they behave erratically and therefore have been poorly understood so far, making earthquake prediction a controversial issue. The scientific detection of anomalies precursors of earthquakes and development early warning system can be possible just through the simultaneous detection of multiple factors. The project is aimed to study what happens during the phase preceding an earthquake, and subsequent correlation and prediction of incoming events. It is foreseen the development of a multidisciplinary station suitable for the measurement of chemical, electromagnetic, meteorological and physical parameters on Earth [3].


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Specific requirements (experiences, skills)
Basic knowledge of nuclear physics, radiation protection, radioactive measurements

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