



## **The Time Series and Cross-spectral Analysis of 17 Years of Tritium and Atmospheric Precipitations in Ramnicu Valcea (Romania)**

Octavian G. Dului (1), Carmen Varlam (2), Ana-Voica Bojar (3,4), and Muataz Dheyaa Shnawaw (5)

(1) University of Bucharest, Faculty of Physics, Structure of the Matter, Earth and Atmospheric Physics and Astrophysics, Magurele (Ilfov), Romania (o.dului@upcmail.ro), (2) National R & D Institute for Cryogenics and Isotopic Technologies - ICSI Rm. Valcea, Ramnicu Valcea, Romania (Carmen.Varlam@icsi.ro), (3) University of Salzburg, Department of Geology and Geodynamics, Salzburg, Austria, (4) Mineralogy, Studienzentrum Naturkunde, Graz, Austria (Ana-Voica.Bojar@sbg.ac.at), (5) University of Bucharest, Faculty of Physics, Doctoral School of Physics, Magurele (Ilfov), Romania

The last 17 years monthly values of precipitation amount and tritium concentration, measured at the Institute of Cryogenics and Isotopes, Ramnicu Valcea, Romania were investigated by means of time series and cross-spectral analysis.

The final results, with  $p < 0.01$ , pointed towards the presence of a single one-year periodicity for both time series. At the same time, the annual distribution of precipitation and tritium indicates an almost overlapping maximum corresponding to summer months. This finding was confirmed by the coherence spectrum of the cross-correlation function with in-phase spectrum showing the presence of one-year maximum. According to modelling we may conclude that tritium at the Ramnicu Valcea collecting point mainly comes from the stratosphere being transported by precipitation, without any sizeable source of anthropogenic local contamination.