

Geoneutrons

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Abstract:

Neutrons in the environment are produced in naturally and in anthropogenic activities. In nature, the origin of neutrons is: Through interactions between cosmic rays and nuclei in ground and the atmosphere, during electric discharges in storms, and are in nuclear reactions in the soil (Geoneutrons, Telluric neutrons or Geogenic neutrons). Alpha emitters in soil are produced in the chain decay of uranium and thorium; some alpha-particles have energies enough to induce (α, n) reactions in nuclei in the soil. Nevertheless, the amount of Geoneutrons is small its characterization is scientifically valuable. In this work we developed a model of the spectrum of the Geoneutrons, using Monte Carlo methods this model was used to determine the doses in sensitive organs of a BOMAB phantom with both genders. The measurement of Geoneutrons spectrum on ground surface is hard because the amount of neutrons is small and these neutrons are mixed with neutrons produced by Cosmic rays. In the aim of validate the model we are carrying on an experiment to measure the thermal neutron contribution of Geoneutrons using pairs of thermoluminescent dosimeters (TLD 600 and TLD 700). In this work we will show the Monte Carlo results and the preliminary results obtained in the experimental work.