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Fifteen years experience of the Nuclear Technology Laboratory of the Aristotle University of Thessaloniki in the technique of in situ gamma spectrometry: Presentation of the major results

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ABSTRACT

The members of the Nuclear Technology Laboratory of the Aristotle University of Thessaloniki in Greece have performed extensive research in the field of in situ gamma spectrometry during the last fifteen years. In the present paper will be presented the major results of the following studies:

- In situ gamma spectrometry measurements for the verification of simulated irradiation conditions at MAYAK PA working places.
- In situ gamma spectrometry measurements and Monte Carlo computations for the detection of radioactive sources in scrap Metal.
- Extended survey of indoor and outdoor terrestrial gamma radiation in Greek urban areas by in situ gamma spectrometry with portable Ge detector.
- Monte-Carlo based method for conversion of in-situ gamma-ray spectrum obtained with portable Ge detector to incident photon flux energy distribution.
- Contribution of Cs-137 to the total absorbed gamma dose rate in air in Greek Forest ecosystems deduced by in situ gamma spectrometry measurements and Monte Carlo computations.
- Combination study of indoor radon and in situ gamma spectrometry measurements in Greek dwellings.

Related Publications in international scientific journals

1. "Monte-Carlo based method for conversion of in-situ gamma-ray spectrum obtained with portable Ge detector to incident photon flux energy distribution." A.Clouvas, S. Xanthos, M.Antonopoulos-Domis, J. Silva. Health Physics, Vol. 74, No 1, pp 216-230 (1998).
2. "Contribution of Cs-137 to the total absorbed gamma dose rate in air in a Greek Forest ecosystem: Measurements and Monte Carlo computations" A.Clouvas, S. Xanthos, M.Antonopoulos-Domis, D. A. Alifragis, Health Physics Vol. 76, No 1 pp 36-43 (1999)
3. "Monte Carlo calculation of dose rate conversion factors for external exposure to photon emitters in soil." A.Clouvas, S. Xanthos, M.Antonopoulos-Domis, Health Physics Vol. 78, No 3 (2000).
4. "Derivation of indoor gamma dose rate from high resolution in situ gamma ray spectra". A.Clouvas, S. Xanthos, M.Antonopoulos-Domis, Health Physics Vol. 79, No 3, pp 274-281 (2000)
5. "Extended survey of indoor and outdoor terrestrial gamma radiation in Greek urban areas by in situ gamma spectrometry with portable Ge detector" A.Clouvas, S. Xanthos, M.Antonopoulos-Domis, Radiation Protection Dosimetry Vol. 94 , No 3 , pp. 233-246 (2001)
6. "A combination study of indoor and in situ gamma spectrometry measurements in Greek dwellings" A. Clouvas, S. Xanthos, M. Antonopoulos-Domis. Radiation Protection Dosimetry Vol 103 ,363-366 (2003)
7. "Radiological maps of outdoor and indoor gamma dose rates in Greek urban areas obtained by in situ gamma ray spectrometry" A. Clouvas, S. Xanthos, M. Antonopoulos-Domis Radiation Protection Dosimetry, Vol. 112, 267-275 (2004)
8. "Radiocesium gamma dose rates in a Greek pine forest :measurements and Monte Carlo computations"A.Clouvas, S. Xanthos, M.Antonopoulos-Domis, D. A. Alifragis, Radioactivity in the Environment Vol. 7, pp 1155-1166,(2005)
9. "In situ gamma spectrometry measurements and Monte Carlo computations for the detection of Radioactive sources in scrap Metal" A. Clouvas, S. Xanthos, G. Takoudis, C. Potiriadis , J. Silva ,Health Physics Vol. 88,No 2, pp 154-162 (2005)
10. "Simultaneous measurements of indoor radon, radon-thoron progeny and high resolution gamma spectrometry in Greek dwellings". A. Clouvas, S. Xanthos, M. Antonopoulos-Domis Radiation Protection Dosimetry, Vol. 118, 482-490, (2006)
11. Measurements and Monte carlo calculations of photon energy distributions in Mayak PA workplaces M. Smetanin,E. Vasilenko, M. Semenov, S. Xanthos, G. Takoudis, A. Clouvas, J. Silva , C. Potiriadis Radiation Protection Dosimetry, Vol. 131,455-468, (2008)
12. "Determining minimum alarm activities of orphan sources in scrap loads; Monte Carlo simulations, validated with measurements". G. Takoudis , S. Xanthos, A. Clouvas, C. Potiriadis, Nuclear Instruments and Methods in Physics Research A 614, 57-67, (2010)