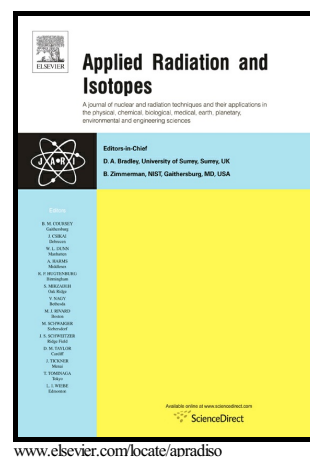


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Joseph A. Borrello, Alan Wuosmaa, Mark Watts



PII: S0969-8043(17)31122-3
DOI: <https://doi.org/10.1016/j.apradiso.2017.12.006>
Reference: ARI8188

To appear in: *Applied Radiation and Isotopes*

Received date: 21 September 2017

Revised date: 4 December 2017

Accepted date: 5 December 2017

Cite this article as: Joseph A. Borrello, Alan Wuosmaa and Mark Watts, Non-dependence of Nuclear Decay Rates of ^{123}I and ^{99m}Tc on Earth-Sun Distance, *Applied Radiation and Isotopes*, <https://doi.org/10.1016/j.apradiso.2017.12.006>

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Non-dependence of Nuclear Decay Rates of ^{123}I and ^{99m}Tc on Earth-Sun Distance

Joseph A. Borrello^{a,*}, Alan Wuosmaa^b, Mark Watts^c

^a*Advanced Radiology Services, 3264 N Evergreen Dr, Grand Rapids, MI 49525*

^b*Department of Physics, University of Connecticut, 2152 Hillside Road, U-3046, Storrs, CT 06269*

^c*Department of Radiology, Bronson Methodist Hospital, 601 John St, Kalamazoo, MI 49007*

Abstract

Recently published studies have suggested an annual fluctuation of the decay rate of several radionuclides, in particular ^{32}Si and ^{226}Ra . Variation of solar neutrino flux caused by variation of Earth-Sun distance has been proposed as the mechanism of this fluctuation. In this study we prospectively look at two radionuclides which have not previously been studied for annual variation, ^{123}I and ^{99m}Tc . Half-lives of samples of these radionuclides were measured approximately weekly and semiweekly respectively over a period of 2 years. Spectral analysis using the Lomb-Scargle method demonstrated no significant periodicity, and in particular, no evidence for a period of 1 year.

Keywords: Radioactivity, Nuclear decay rates, ^{123}I , ^{99m}Tc

1. Introduction

In 2009 a study was published by Jenkins et. al. [1] which suggested the possibility of annual variations in the activity of certain radionuclides. This was

*Corresponding author

Email address: jborrello@advancedrad.com (Joseph A. Borrello)

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