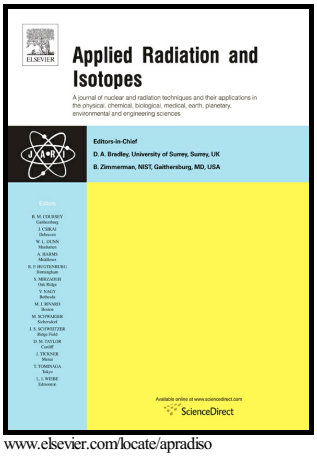

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Non-dependence of Nuclear Decay Rates of ^{123}I and ^{99m}Tc on Earth-Sun Distance

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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

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