

Energy spectra and fluence of the neutrons produced in deformed space-time conditions

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Received 8 June 2016

Revised 4 August 2016

Accepted 16 August 2016

Published 4 October 2016

In this work, spectra of energy and fluence of neutrons produced in the conditions of deformed space-time (DST), due to the violation of the local Lorentz invariance (LLI) in the nuclear interactions are shown for the first time. DST-neutrons are produced by a mechanical process in which AISI 304 steel bars undergo a sonication using ultrasounds with 20 kHz and 330 W. The energy spectrum of the DST-neutrons has been investigated both at low (less than 0.4 MeV) and at high (up to 4 MeV) energy. We could conclude that the DST-neutrons have different spectra for different energy intervals. It is therefore possible to hypothesize that the DST-neutrons production presents peculiar features not only with respect to the time (asynchrony) and space (asymmetry) but also in the neutron energy spectra.

Keywords: Neutrons; energy; deformed space-time; local Lorentz invariance; spectra measurements.

1. Foreword

Emissions of nuclear particles, neutrons and alphas, from liquid or solid materials that have undergone changes in energy density induced by ultrasound pressure or other mechanical processes have been studied in past papers.¹⁻⁶ It has been verified that such emissions are asynchronous or rather that they lack any temporal structure displaying periodicity or any recurrence, and that they are asymmetric, i.e. they have a spatial distribution which is anisotropic, yet dependent on direction.⁶⁻⁹ However, testing has confirmed that the peculiarities of the emissions displaying

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