



Contribution ID: 84

Type: Talk

Fissile nuclei rotation effect in $^{235}\text{U}(n,\gamma f)$ process

Tuesday 7 December 2021 13:15 (25 minutes)

T-odd effects in fission of heavy nuclei have been extensively studied during more than a decade in order to study the dynamics of the process. A collaboration of Russian and European institutes discovered the effects in the ternary fission in a series of experiments performed at the ILL reactor (Grenoble) [1-3] and the effects were carefully measured for a number of fissioning nuclei. The analogous effects for gammas and neutrons in fission of ^{235}U and ^{233}U was also measured [3-6] after the observation of T-odd effects for ternary particles accompanying the reaction $^{235}\text{U}(n,f)$ induced by cold polarized neutrons. All experiments up to now were performed with cold polarized neutrons, which suggests a mixture of several spin states of the compound nucleus, the relative contributions of which are not well known. The measurements of gamma and neutron asymmetries in an isolated resonance of uranium is important in order to get “clean” data. Therefore, our team continues to carry out a series of experiments by polarized neutrons with different energies. The present work describes a number of our team’s measurements that include the results of T-odd effects in the fission of uranium isotopes by polarized neutrons with different energies at the POLI facility of the FRM II reactor in Garching.

- [1] P. Jesinger, G.V. Danilyan, A.M. Gagarski, et al., Phys. At. Nucl. 62, 1608 (1999)
- [2] P. Jesinger, A. Kotzle, A. Gagarski, et al., Nucl. Instrum. Methods Phys. Res. A 440, 618 (2000)
- [3] Y. Kopatch, V. Novitsky, G. Ahmadov et. al., EPJ Web of Conferences 169, 00010 (2018)
- [4] G.V. Danilyan, J. Klenke, V.A. Krakhotin, et al., Phys. At. Nucl. 72, 1812 (2009)
- [5] G.V. Danilyan, J. Klenke, V.A. Krakhotin, et al., Phys. At. Nucl. 74, 671 (2011)
- [6] G.V. Danilyan, J. Klenke, Yu.N. Kopach, et al., Phys. At. Nucl. 77, 677 (2014)

Authors: GAGARSKI, Alexei (Petersburg Nuclear Physics Institute of National Research Centre “Kurchatov Institute”); BERIKOV, Daniyar; AHMADOV, Gadir (Joint Institute for Nuclear Research); DANILYAN, Gevorg (Institute for Theoretical and Experimental Physics of National Research Centre “Kurchatov Institute”); DENG, Hao; KLENKE, Jens (FRM II); MASALOVICH, Sergey; NOVITSKY, Vadim (Joint Institute for Nuclear Research); HUTANU, Vladimir; KOPATCH, Yuri (Joint Institute for Nuclear Research)

Presenter: BERIKOV, Daniyar

Session Classification: Nuclear, Particle, and Astrophysics

Track Classification: Nuclear, Particle, and Astrophysics