

# Angular Correlation ( $n', \gamma$ ) in Reaction of Neutron's Inelastic Scattering on $^{12}\text{C}$

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The knowledge about ( $n, \gamma$ ) and ( $n, n'\gamma$ ) correlations is very useful for understanding of the neutron inelastic scattering process and estimations of the impacts of direct and compound (CN) mechanisms on the nuclear reaction. A detailed review of the CN approach is presented in the paper [1], for direct - in [2]. Formalism described in [1] works quite well for low-energy particle scattering when CN is dominant but fails to describe 14 MeV neutrons scattering [3]. There are not too many experiments with ( $n, n'\gamma$ ) correlation measurements with 14 MeV neutrons, and the largest part of them were made more than 40 years ago with a quite poor accuracy [4]. Thus, it is interesting to make new experiments to survey this correlation with higher statistics and angular resolution. At this moment the experiment with tagged neutrons is being carried out on TANGRA with a carbon target. It is planned to extract data about ( $n', \gamma$ ) correlation from this experiment. To estimate the needed measurement time and optimize the experimental setup for future measurements we are working on the angular correlation ( $n', \gamma$ ) modelling in Geant4's, since now there is no information about ( $n', \gamma$ ) anisotropy. Modelling results are compared with experimental results.

In the future, the angular anisotropy of emitted  $\gamma$  relative to scattered neutron  $n'$  perpendicular to the plane reaction might become a question of interest.

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