ANGULAR CORRELATION IN INELASTIC SCATTERING ^{24}Mg(p, p$_1\gamma$)^{24}Mg AT E_p = 7.4 MeV

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The angular correlation functions (ACF) that is the double differential cross section $W(\theta_\gamma, \varphi_\gamma; \theta_p)$ was measured for the inelastic ^{24}Mg(p, p$_1\gamma$)^{24}Mg scattering for several angles θ_p in the range from 30° to 150° (lab.) at 120-cm cyclotron of SINP MSU at E_p = 7.4 MeV. The ACF measurements were carried out on a three planes φ_γ of γ-rays registration that allowed to restore all density matrix spin-tensor even components of the final nucleus ^{24}Mg(2$^+$, 1.369 MeV) for each angle θ_p [1].

Analysis of the experimental characteristics of the reaction was performed assuming the collective interaction mechanism by the coupled-channel method and mechanism of the compound nucleus formation.

The comparison of the calculated and experimental ACF shows that calculation qalitatively corresponds to the position of the extrema but the relative values ACF differs considerably for some θ_p and φ_γ (example on Fig. 1).

This suggests the need for careful choice of different scattering mechanisms contribution, including the mechanism of resonance scattering through the formation of one or more compound nucleus levels.

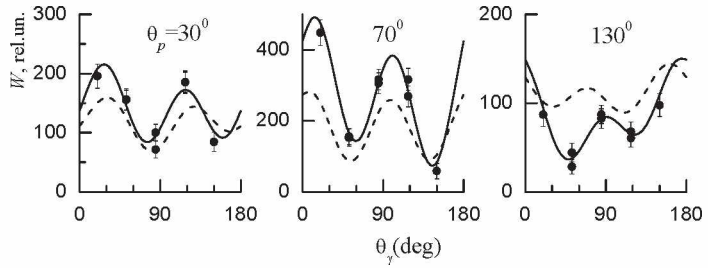

Fig. 1. Angular correlation functions in inelastic p-scattering on ^{24}Mg at some θ_p (lab.) in reaction plane. The solid curves represent a nine-parameter fit to experimental results. The dashed curves correspond to the sum of the compound nucleus *formation* and *collective interaction mechanisms.*

1. N.S.Zelenskaya, I.B.Teplov. Properies of Excited Nuclear States and Angular Correlation in Nuclear Reactions. Moscow: Energoatomizdat, 1995 [in Russian].