

THE MEASUREMENTS OF DIFFRACTION OF THE ANGULAR DISTRIBUTIONS OF ALPHA PARTICLES WITH ENERGIES 29 MeV ON NUCLEI ^{59}Co , ^{197}Au , ^{209}Bi

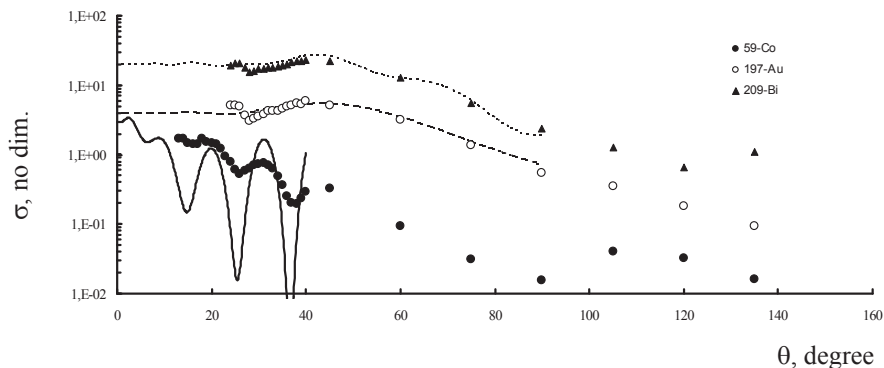
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Fraunhofer and Fresnel nuclear diffraction was measured for the study of the odd shape of medium and heavy nuclei, in which, as a rule, collective states are not discovered and inelastic scattering can not be measured due to insufficient energy resolution of the spectrometer. The diffraction of angular distributions of differential cross sections of elastically scattered alpha particles with energy 29 MeV on nuclei ^{59}Co , ^{197}Au , ^{209}Bi was measured. Alpha-particle beam was extracted from the isochronous cyclotron U-150M (Republic of Kazakhstan).



The figure shows the experimental angular distributions compared with theoretical calculations in the framework of parameterized phase analysis. Fit into the angle responsible for the Fraunhofer scattering mechanism yielded average size of studied nuclei. A theoretical optimization of parameters in the range of small angles (Fresnel mechanism) yielded signs of deformation of these odd nuclei. Together with the analysis of the world's available literature data in this paper concludes their positive (^{209}Bi , ^{197}Au) and negative (^{59}Co) deformation that agrees satisfactorily with the systematization of work [1, 2].

1. A.V.Yushkov // Phys. of Elem. Part. and Atomic Nucl. 1993. V.24(2). P.348

2. V.V.Dyachkov *et al.* // Izv. RAN. Phys. 2012. V.76(8). P.1011.