# DIPOLE RESONANCE SPLITTING AND SHELL STRUCTURE PECULIARITIES OF $^{52}$Cr NUCLEUS

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Microscopic description of giant resonances and resonance of higher multipolaties (MGR) in $^{52}$Cr and $^{54}$Fe nuclei was performed in the multiparticle shell model (MSM). The resonances in nuclear excitations cross sections according to MSM are results of doorway-states' collectivisation. This approach was quite successful in interpretations of the main peaks locations on the energy axis for magic nuclei but not for the even-even non-magic ones. Some advance in the interpretation of MGR fragmentation could be attained in the Particle-Core Coupling Version of MSM (PCC SM). PCC SM takes into account the spreading of hole configurations among the states ($A$-1) daughter nuclei [1]. A full set of basic configurations generating $E1$ resonances could be obtained from the hole state distribution's analysis revealed in pick-up reaction spectroscopy. This method allows to get a realistic description of $E1$ resonance in $^{54}$Fe nucleus [2]. The $^{54}$Fe nucleus has two additional protons in comparison with $^{52}$Cr in unfilled $1f_{7/2}$ subshell. The spectroscopic factors' distributions in both nuclei show considerable fragmentation of $1f_{7/2}$ subshell as well as deeper subshells. The energy splitting of subshells revealed in the pick-up reaction spectroscopy of $^{52}$Cr together with isospin splitting are the main sources of strengths of $E1$ resonance fragmentation. The results of PCC SM calculations based on spectroscopy [3] and the comparison with experiment [4] are shown in the Fig.1.

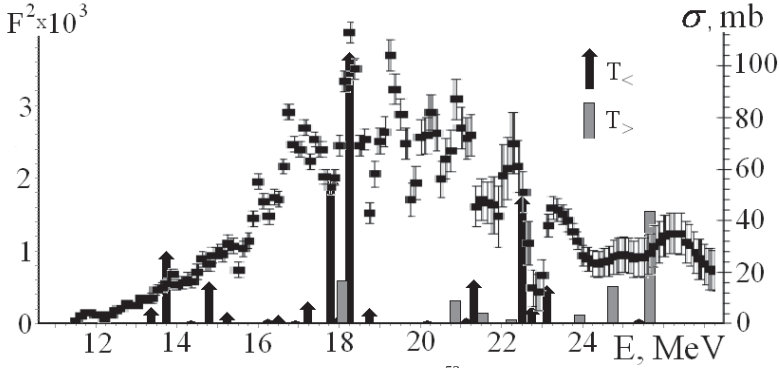


*Fig. 1. E1 resonance in $^{52}$Cr nucleus.*

1. N.G.Goncharova, N.P.Yudin // Phys. Lett. B. 1969. V.29. P.272.
2. N.G.Goncharova, A.P.Dolgodvorov // Phys. of At. Nucl. 2014. V.77. P.200.
3. S.Fortier, E.Hourani, M.N.Rao, *et al.* // Nucl. Phys. A. 1978. V.311. P.324.
4. B.I.Goryachev, B.S.Ishkhanov, I.M.Kapitonov, *et al.* // Izv.AN SSSR. S. Fiz. 1969. V.33. P.1736.