WIDTH OF THE GIANT DIPOLE RESONANCE IN HEAVY NUCLEI

Kapitonov I.M.
D.V.Skobeltzyn Institute of Nuclear Physics and Faculty of Physics of M.V.Lomonosov Moscow State University, Russia
E-mail: igor-kapitonov@yandex.ru

Based on the analysis of available experimental data on the widths of the giant dipole resonance (GDR) and the parameters of the quadrupole deformation of nuclei with $Z \geq 50$ is demonstrated a high degree of correlation between these values. The conclusion is that the quadrupole deformation is the only significant factor broadening (splitting) of GDR for heavy non-spherical nuclei. The database of the Web-site of the Centre for Photonuclear Experiments data SINP MSU was used. 116 Cross sections for 73 isotopes received by the most reliable experimental techniques were selected. As the data of experiments on registration of photoneutron and experiments on nuclear photoabsorption were used. Parameter of the quadrupole deformation δ is determined in accordance with the monograph Aage Bohr and Ben R. Mottelson "Nuclear Structure". The results of the analysis are presented in figure, where for the same isotopes experimental widths of the GDR (dark spots) are compared with the values $|\delta|$ (bright dots) calculated with the formula $\Gamma = \Gamma_0 + \Delta\Gamma$, in which $\Gamma_0 = 4$ MeV - GDR width for heavy spherical nuclei (dotted line), and $\Delta\Gamma = 11 \cdot |\delta|$ MeV - the value of deformation splitting (broadening) of the GDR. Crosses - calculated widths of the GDR for the areas with mass number (A = 200-205 and 210-230), where the photonuclear cross sections are absent.