

# Tuning Effect in Nuclear Binding Energies

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Data files of experimental nuclear binding energies ( $E_B$ ), mainly from AME-95 [1], and nucleon separation energies ( $S_N$ ,  $S_{2N}$  etc.) together with  $E_B$  from different theoretical models (FRDM, FRLDM, RMF, ETFSI-1, HFBCS-1, KUTY) were used to study the observed in [2] stable character of intervals in binding energies (tuning effect in  $E_B$ ). This effect was checked in [3-5] by observation of maxima in several distributions of  $\Delta E_B$  in a broad scope of nuclei with certain combinations of differences of  $Z$  and  $N$ . Tuning effect exists only in experimental data and in Fig.1-2 some additional correlations with a period  $\Delta=4.6$  MeV found in [2] are shown.

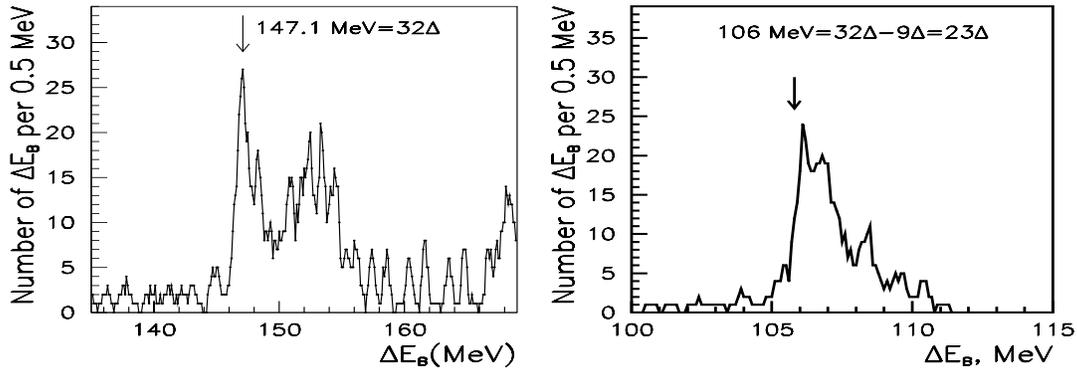


Fig.1. Differences of  $E_B$  in nuclei with  $\Delta Z=8$ ,  $\Delta N=14$  (left) and  $\Delta Z=6$ ,  $\Delta N=10$  .

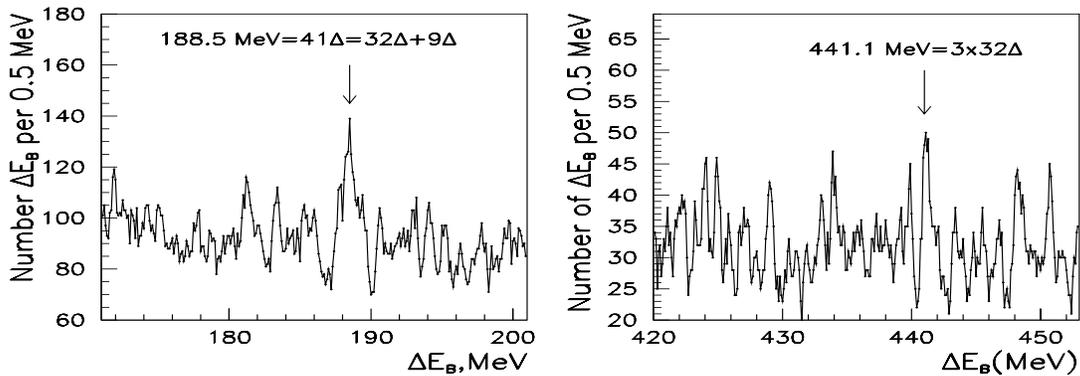


Fig.2. Differences of  $E_B$  in N-even nuclei (left) and in odd-odd nuclei [4].

The role of RIB-data in the check of the tuning effect in  $E_B$  as a phenomenon of the hadronic physics and possible connection of these effects with some unsolved problems of the Standard Model [6] will be discussed.

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- [6] S.I.Sukhoruchkin, Proc. 3rd Symp. Symm. Subat. Phys., AIP 539, p.142 (2000).