# STRUCTURE OF β-DECAY STRENGTH FUNCTION $S_\beta(E)$, SU(4) REGION AND QUENCHING OF AXIAL-VECTOR WEAK INTERACTION CONSTANT IN HALO NUCLEI

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In heavy and middle nuclei, because of repulsive character of the spin-isospin residual interaction, the energy of Gamow-Teller (GT) resonance (GTR) is larger than the energy of isobar-analogue resonance (IAR), $E_{GTR} > E_{IAR}$ [1, 2]. One of the consequences [3, 4] of Wigner's spin-isospin SU(4) symmetry is $E_{GTR} = E_{IAR}$. SU(4) symmetry-restoration effect induced by the residual interaction, which displaces the GTR towards the IAR with increasing $(N - Z)/A$.

In $^6$Li nucleus [5] for low energy super-GT phonon [6] or GTR (experimental reduced GT strength $B(\mathrm{GT}) = 7.630 g_V^2/4\pi$, Σ(Ikeda sum rule) $= 6(g_A^{eff})^2/4\pi$) we have $E_{GTR} < E_{IAR}$, $E_{GTR} - E_{IAR} = -3562.88$ keV, where $g_V$ and $g_A^{eff}$ are the vector and effective axial-vector weak interaction constants. In $^{11}$Be nucleus for low energy ($E = 18.19$ MeV) super-GT phonon or GTR (experimental reduced GT strength $B(\mathrm{GT}) = 23 g_V^2/4\pi$, Σ(Ikeda sum rule) $= 15(g_A^{eff})^2/4\pi$) we have $E_{GTR} < E_{IAR}$, $E_{GTR} - E_{IAR} = -2.97$ MeV. Using these data and data about $E_{GTR} - E_{IAR}$ from [1, 2], we estimated that the value $Z/N = 0.5 - 0.6$ corresponds to the region, where $E_{GTR} \approx E_{IAR}$, i.e. SU(4) region [5].

Resonance structure of the $S_\beta(E)$ for GT β-decay in halo $^6$He and $^{11}$Li nuclei is analyzed. The free-nucleon value of axial-vector weak constant $g_A$ is well known from neutron β-decay data: $g_A/g_V = -1.2723(23)$, $(g_A/g_V)^2 = 1.618$. Inside nuclear matter value of $g_A$ is effected by many nucleon correlations [7] and quenched or enhanced value of $g_A^{eff}$ might be needed to reproduce experimental data. Compare experimental total strength for β-transitions in $g_V^2/4\pi$ units with the Ikeda sum rule in $(g_A^{eff})^2/4\pi$ units, one can determine [1, 2] the ratio of squared axial-vector and vector weak interaction constants value $(g_A^{eff}/g_V)^2$. We obtained that $(g_A^{eff}/g_V)^2 = 1.272 \pm 0.010$ for $^6$He, and $(g_A^{eff}/g_V)^2 = 1.5 \pm 0.2$ for $^{11}$Li β-decays.

Quenching of the weak axial-vector constant $g_A^{eff}$ in halo nuclei is discussed.

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