Weak decays of ${}^{10}_{\Lambda}$Be and ${}^{10}_{\Lambda}$B hypernuclei: what they tell us?

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ABSTRACT

Hypernuclei not only bring a new flavor - strangeness to nuclear physics, they provide also a background to extension of nucleon - nucleon interaction into baryon - baryon one [1]. They are a convenient laboratory to study the four baryon $\Lambda N \to NN$ weak interaction and associated effective weak Hamiltonian [2].

We have proposed [3] to use the unique feature of the ^{9}Be nucleus: after removing a neutron from its ground state several groups of α-particles appear from different excited states of a residual nucleus ^{8}Be.

Due to these specific properties of the core nuclei ^{9}Be and ^{9}B, it may be possible for the ${}^{10}_{\Lambda}$Be and ${}^{10}_{\Lambda}$B hypernuclei to measure the PARTIAL DECAY widths (including neutron ones) $\Gamma^{n\,(p)}_{\alpha\alpha\,i}$ corresponding to states of the residual nucleus ^{8}Be decaying through the $\alpha\,\alpha$-channel.

In such a way we can determine exactly **one-nucleon stimulated** process $\Lambda N \to NN$ [4] as well as **spin-dependent part** of the weak matrix elements [5].

References

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