Meson exchange in the weak decay of Λ hypernuclei and the Γ_n/Γ_p ratio

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Abstract

We take an approach to the Λ non-mesonic weak decay in nuclei based on the exchange of mesons. The one pion and one kaon exchange are considered, together with the exchange of two pions, either correlated, leading to an important scalar-isoscalar exchange (σ-like exchange), or uncorrelated (box diagrams). Extra effects of ω exchange in the scalar-isoscalar channel are also considered. Constraints of chiral dynamics are used to generate these exchanges. A drastic reduction of the OPE results for the Γ_n/Γ_p ratio is obtained and the new results are compatible with all present experiments within errors. The absolute rates obtained for different nuclei are also in good agreement with experiment.