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Charge symmetry breaking in hypernuclei within RMF model

We study the charge symmetry breaking (CSB) effect in the binding energy of mirror hypernuclei in the mass region $A = 7 \sim 48$ in relativistic mean field (RMF) models introducing NN and ΛN interactions. The phenomenological ΛN CSB interaction is introduced and the strength parameter is fitted to reproduce the experimental binding energy difference between the mirror hypernuclei ${}_{\Lambda}^{12}\text{B}$ and ${}_{\Lambda}^{12}\text{C}$. This model is applied to calculate the CSB energy anomaly in mirror hypernuclei with the mass $A = 7 \sim 48$. The model is further applied to predict the binding energy difference of mirror hypernuclei of $A=40$ with the isospin $T = 1/2, 3/2$ and $5/2$ nuclei together with various hyper Ca isotopes and their mirror hypernuclei. Finally the binding energy systematics of $A = 48$ hypernuclei are predicted with/without the CSB effect by the PK1 and TM2 energy density functionals (EDFs).

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