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A Reliability Analysis of Calculated Results for Odd-Even and Odd-Odd Nuclei in Relativistic Mean-Field Theory

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Abstract: We calculate the binding energies of Ni, Cu, Xe, Cs, Pt, Au, Np, Pu isotope chains using two interaction parameter sets NL-3 and NL-Z, and compared the relative errors of the even-even nuclei with those of odd-even nuclei and odd-odd nuclei. We find that the errors of binding energy of odd-even and odd-odd nuclei are not bigger than the one of even-even nuclei. The result shows that comparing with even-even nuclei, there is no systematic error and approximation in the calculations of the binding energy of odd-even and odd-odd nuclei with relativistic mean-field theory. In addition, the result is explained theoretically.

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