

Nuclear Symmetry Energy and Surface Properties of Exotic Nuclei

**M. K. Gaidarov¹, A. N. Antonov¹, P. Sarriguren²,
E. Moya de Guerra³**

¹Institute for Nuclear Research and Nuclear Energy,
Bulgarian Academy of Sciences, Sofia 1784, Bulgaria

²Instituto de Estructura de la Materia, CSIC, Serrano 123,
E-28006 Madrid, Spain

³Departamento de Física Atomica, Molecular y Nuclear, Facultad
de Ciencias Físicas, Universidad Complutense de Madrid,
E-28040 Madrid, Spain

We study the correlation between the thickness of the neutron skin in finite nuclei and the nuclear symmetry energy for isotopic chains of even-even Ni, Sn, and Pb nuclei in the framework of the deformed self-consistent mean-field Skyrme HF+BCS method [1–3]. The symmetry energy, the neutron pressure and the asymmetric compressibility in finite nuclei are calculated within the coherent density fluctuation model [4, 5] using the symmetry energy as a function of density within the Brueckner energy-density functional [6]. The mass dependence of the nuclear symmetry energy and the neutron skin thickness are also studied together with the role of the neutron-proton asymmetry. A correlation between the parameters of the equation of state (symmetry energy and its density slope) and the neutron skin is suggested in the isotopic chains of Ni, Sn, and Pb nuclei.

References

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