Neutron Halos in the Excited States of Spherical Nuclei Near the β-Stable Line

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Abstract: The newly discovered neutron halos in the excited states of nuclei ^{12}B, ^{13}C, and ^{209}Pb are studied by the relativistic mean-field theory. The calculated binding energies are very close to the experimental ones. The experimentally extracted root-mean-square radii of the last neutron with different occupations in nuclei are well reproduced by calculations. New candidates for the neutron halos in excited states are predicted and are useful for further search of neutron halos in the excited states of stable nuclei.

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