

The effect of the tensor force on the predictions for superheavy nuclei

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The effect of the tensor component of the effective nucleon-nucleon interaction on the single-particle structure in the superheavy elements is studied within the framework of the spherical Skyrme Hartree-Fock + BCS model^[1]. A selection of the available Skyrme forces has been chosen and their predictions for the proton and neutron shell closures investigated.

The inclusion of the tensor term with realistic coupling strength parameters^[2,3] generally leads to an increased spin-orbit splitting between the proton $2f_{7/2}$ and $2f_{7/2}$ partners, opening the $Z=114$ shell gap. The $Z=126$ gap, predicted by these models in the absence of the tensor term^[4], is found to be strongly dependent on neutron number. The predicted neutron shell structures remain unchanged after the inclusion of the tensor component.

[1] E.B. Suckling and P.D. Stevenson, submitted to Phys. Rev. Lett.

[2] G. Colò et al., Phys. Lett. **B646**, 227 (2007).

[3] B.A. Brown et al., Phys. Rev. **C74**, 061303 (2006).

[4] M. Bender et al., Phys. Rev. **C60**, 034304 (1999).