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The evolution of magic numbers in silicon and sulfur isotopes

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The evolution of single particle states and the related tendencies occurring for the classic magic numbers $N=20$ and $N=28$ were investigated for the even-even silicon ($Z=14$) and sulfur ($Z=16$) isotopes. In order to define the single particle energies for the stable isotopes of Si the set of pickup and stripping reactions data was analyzed [1, 2]. The single particle energies for the exotic isotopes were evaluated using the excited state spectra of the adjacent odd isotopes and the experimental data on the occupancies of the stable nuclei [3]. As long as $Z, N=14, 16$ tend to reveal the properties of the classic magic numbers in the Si and S isotopic chains, the corresponding features of these numbers rising from the obtained single particle energies were investigated as well.

[1] A. Bohr, B. R. Mottelson /Nuclear structure , World Scientific Publishing Co, Vol.1, P. 420 (1998)

[2] G. Mairle, et al/ Phys. Rev. C ,Vol. 47, P. 2113 (1993)

[3] M. L. Markova, T.Yu. Tretyakova, N. A. Fedorov/ Moscow University Physics Bulletin, to be published (2017)

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