

First spectroscopy of neutron-rich Sc isotopes in the third SEASTAR campaign

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Abstract. The existence of the “magic number” $N = 34$ has been shown to exist for ^{54}Ca [1] and recently for ^{52}Ar [2], but shown to vanish in Ti isotopes [3, 4] and ^{55}Sc [5]. The origin of this “magic number” in ^{54}Ca was connected, through the concept of the *Tensor force* [6, 7], to the interaction between the $\pi f_{7/2}-\nu f_{5/2}$ orbitals. The evolution of proton orbitals in the $^{55-61}\text{Sc}$ isotopes may reveal the mechanism of the disappearance of the $N = 34$ magicity, and further elucidate the early onset of collectivity at $N = 40$, which has so far only been observed in Cr and Fe isotopes. The preliminary results of the analysis of the $^{55-59}\text{Sc}$ data from the third SEASTAR campaign at RIKEN-RIBF will be presented. For $^{57,59}\text{Sc}$ γ rays will be shown here for the first time and possible level schemes will be proposed. This work was supported by the HGS-HIRE for FAIR through the HGS-HIRE abroad program and the BMBF under the Grant No. 05P19RDFN1.

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