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Structural Evolution of the Neutron-Rich Calcium Isotopes

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Understanding the structure of atomic nuclei at the extremes of the Segre chart is of paramount importance in nuclear physics. In these nuclei, often termed exotic, new shell closures may emerge, while others may disappear. A crucial region is formed by the neutron rich Calcium isotopes, with striking appearances of new magic numbers at $N = 32$ and $N = 34$.

Within the SEASTAR (Shell Evolution And Search for Two-plus energies At RIBF) project at the RIBF, the most neutron-rich Calcium isotopes to-date and their neighboring isotones were studied by means of in-beam gamma-ray spectroscopy of fast moving nuclei, yielding new insight in to the driving mechanisms of shell evolution in the region (e.g [1, 2, 3, 4, 5, 6, 7, 8, 9]).

Besides providing a short description of the setup, my presentation will focus on the first spectroscopy of the neutron-rich Calcium isotopes $^{55,56,57,58}\text{Ca}$, as well as detailed spectroscopy of ^{54}Ca , providing new insights into the possible new doubly magic nucleus ^{60}Ca .

- [1] H. Liu et al., Phys. Rev. Lett. 122, 072502 (2019).
- [2] S. Chen et al., Phys. Rev. Lett. 123, 142501 (2019).
- [3] M.L. Cortes et al., Phys. Lett. B 800, 135071 (2020).
- [4] Y.L. Sun et al., Phys. Lett. B 802, 135215 (2020).
- [5] M.M. Juhasz et al., Phys. Lett. B 814, 136108 (2021).
- [6] F. Browne et al., Phys. Rev. Lett. 126, 252501 (2021).
- [7] B.D. Linh et al., Phys. Rev. C 104, 044331 (2022).
- [8] T. Koiwai et al., Phys. Lett. B 827, 136953 (2022).
- [9] M. Enciu et al., Phys. Rev. Lett. 129, 262501 (2022).

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