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Nuclear structure physics with radioactive-ion beams at HIE-ISOLDE

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HIE-ISOLDE [1] at CERN reached the end of phase 2 in 2018, operating with four cryomodules for the first time and reaching the original design energy of 10 MeV/ u for radioactive ion beams.

Experiments have been focused on two experimental setups so far, with the Miniball HPGe array [2] taking most of the beam time and the Scattering Experiments Chamber (SEC) concentrating on reactions with light nuclei.

The ISOLDE Solenoidal Spectrometer (ISS) [3] was newly commissioned in 2018 for few-nucleon transfer reactions in the magnetic field of a former MRI magnet.

In this talk I will present the HIE-ISOLDE project and show preliminary status of experiments from three years of operation.

Some of the selected physics cases will be, amongst others, Coulomb excitation at both ends of the Sn isotopic chain and studying octupole collectivity in both the lanthanides and the actinides.

Finally, preliminary results from the first two experiments at ISS will also be discussed, along with plans for the future of the device.

References:

[1] M. Lindroos, P. Butler, M. Huyse, and K. Riisager, Nucl. Instrum. Meth. B 266, 4687 (2008).

[2] N. Warr et al., Eur. Phys. J. A 49, 40 (2013).

[3] S. J. Freeman et al., CERN-INTC 031, 099 (2010).

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