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Technical study of the MAGDEM ion test bench for the ISOLDE Superconducting Recoil Separator

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The ISOLDE Superconducting Fragment Separator (ISRS) is composed of a set of multifunction CCT superconducting magnets (MAGDEM) [1, 2], including both dipole and quadrupole functions [3]. A fully operational ion test bench (IONTB) is being developed to test the performance of the MAGDEM units under a realistic in-beam scenario. Despite being limited to a single MAGDEM unit, IONTB can provide enough A/Q selectivity for light fragments and be operated as a linear spectrometer [4, 5] for selected physic cases. The system includes a reaction chamber, beam transport system and diagnostics, a prototype of focal plane detector. The complete system will be assembled into a rotatory platform suitable to analyse forward ejected reaction fragments at user-selected observation angles. The control and data acquisition system plays a critical role and requires a dedicated development.

References

- [1] I. Martel et al, Letter of Intent "Design study of a Superconducting Recoil Separator for HIE-ISOLDE", INTC-I-228, 2021. [2] ISRS project web site, www.uhu.es/isrs/
- [3] G. Kirby et al., "Design and Optimization of a 4 Tesla 200 mm Aperture Helium-Free Nb-Ti CCT Nested Quadrupole / Dipole Superconducting Magnet". ASC2024 ID 4070214/1LOr1B-07, in press.
- [4] J. Giner-Navarro et al., "Progress on beam dynamics studies for ISRS", poster contribution to this workshop.
- [5] S. Sánchez-Navas, "Test Bench for the ISOLDE superconducting Recoil Separator ISRS", poster contribution to this workshop.

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