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EPIC: Exploiting the Potential of ISOLDE at CERN

The user's community of ISOLDE, CERN's radioactive ion beam (RIB) facility, has been steadily growing in the last 10-15 years, thanks to the increasing range of research fields that opened up when post-accelerated radioactive beams and more isotopes became available. The demand for beam time therefore outnumbers the current production capabilities. The EPIC project takes full advantage of the recent upgrades at CERN, driven by the LHC Injectors Upgrade (LIU). In particular, the new Linac4 with its higher proton currents and the PS booster with its higher proton beam energies allow expanding the scope of ISOLDE. With a higher proton beam intensity and energy impinging on the ISOLDE target stations, significantly higher radioactive beam intensities are achieved. Additionally, this higher proton current can be divided among two target stations, constructed in such a way that parallel radioactive beams can be delivered to the many low energy (40-60 keV) and high-energy (1-10 MeV/nucleon from HIE-ISOLDE) radioactive beam experiments. This will allow doubling the amount of beam time, which is highly demanded by the continuously growing ISOLDE user's community. Furthermore, ISOLDE aims at attracting new users to take even more advantage of the increased beam time, by constructing a storage ring behind the HIE-ISOLDE post-accelerator. Thus, stored cooled exotic beams from light up to heavy short-lived isotopes will be available and open up new possibilities in the fields of astrophysics, fundamental symmetry studies, atomic physics and nuclear physics. All of these upgrades guarantee that ISOLDE remains a unique facility in Europe and even in the world, as nowhere else a proton driver with these properties is available for producing a very wide range of radioactive isotopes, nor is there a facility that has (or plans) a low-energy storage ring for short-lived isotopes, allowing unique experiments in diverse fields.

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