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PERLE: a novel facility for ERL development and applications in multi-turn configuration and high-power regime

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The development of ERLs has been recognized as one of the five main pillars of accelerators R&D in support of the European Strategy for Particle Physics (ESPP). The international panel in charge of the ERL Roadmap definition recognized PERLE project as “a central part of the roadmap for the development of energy-recovery linacs”, with milestones to be achieved by the next ESPP in 2026.

PERLE project is aiming at the construction of a novel ERL facility for the development and application of the energy recovery technique in multi-turn configuration, high current and large energy regime. It will operate in a 3-turns mode, first at 250 MeV, then upgraded to 500 MeV with 20mA beam current. Such challenging parameters make PERLE a unique multi-turn ERL facility operating at an unexplored operational power regime (10MW), studying and validating a broad range of accelerator phenomena, paving the way for the future larger scale ERLs.

PERLE will be the necessary demonstrator for the future HEP machine (LHeC / FCC-eh), with which it shares the same technological choices and beam parameters. Furthermore, PERLE opens a new frontier for the physics of “the electromagnetic probe”. It will be the first ERL dedicated to Nuclear Physics for studying the eN interaction with radioactive nuclei.

Here we will report on the project status, introduce the main ongoing achievements and describe the staged strategy we will adopt toward the construction of PERLE machine at its nominal performances.

Funding Agency

Footnotes

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