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Progress and challenges on SRF technology development for PERLE

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Powerful Energy Recovery Linac for Experiments (PERLE) is a compact three-pass ERL project based on SRF technology, being as a new generation machine targeting the 5 MW beam power regime. PERLE will serve as a hub for the validation and exploration of a broad range of accelerator phenomena in an unexplored operational power regime serving for the development of ERL technology for future energy and intensity frontier machines. The SRF cavities have been designed and prototyped to be similar or virtually identically to the ttbar option of FCCee, namely, 800 MHz bulk niobium cavities with Q_0>3×10^10 around 22 MV/m. This ambitious performance will be enabled by state-of-the-art medium temperature baking. In this contribution, we discuss progress and challenges in cavity fabrication, higher order mode couplers and beam line absorbers, and the cryomodule with a special focus on magnetic shield and potential flux expulsion scheme.

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Footnotes

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