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Overview of inverse Compton scattering feasibility studies at MESA

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Johannes Gutenberg University Mainz is currently constructing a new electron accelerator that employs an energy recovery scheme. The Mainz Energy Recovery Superconducting Accelerator (MESA) will provide two modes of operation: the Energy Recovery (ER) mode, which will supply an internal gas target experiment, and the Extraction Beam (EB) mode, primarily used in the P2 experiment where MESA's spin-polarized electrons will be directed towards a target.

As an Energy Recovery Linac (ERL), MESA shows potential as an accelerator for an Inverse Compton Scattering (ICS)-based gamma source. To anticipate the impact of the scattering on electron beam parameters, significant for energy recovery, a novel quasi-analytical simulation code, "COMPARSE", has been developed and used for the feasibility studies. The investigations examine various applications of ICS sources at MESA. This paper gives an overview of the results as well as the limitations and possibilities of the underlying mathematical approach.

Footnotes

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