SCIENCE CASE FOR ENERGY RECOVERY LINAC X-RAY SOURCES

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Abstract

Energy Recovery Linacs (ERLs) have potential to produce hard x-ray beams that overcome many of the limitations of beams from storage ring sources. These include sufficiently small transverse emittances to provide x-ray beams with near unity transverse coherence at 10 keV, x-ray pulses shorter than 100 femtoseconds, and a small round source size that facilitates production of intense x-ray probe nanobeams. These are discussed in the context of the 5 GeV ERL being planned as an upgrade to the exiting storage ring at Cornell University. Projected characteristics of the machine, its possible x-ray beams will be presented. Examples of novel science that is enabled with the beams will be presented.

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