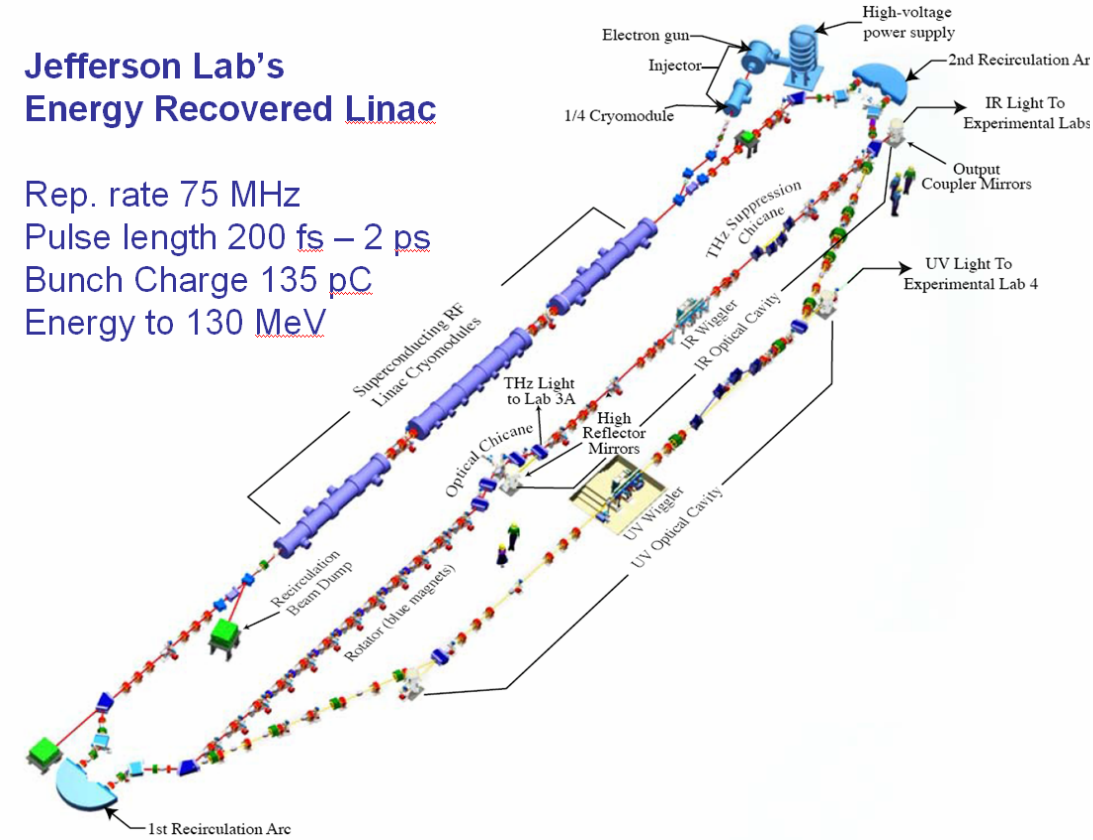
Applications of Intense CSR from a cw Linac at Jefferson Lab

, Gwyn P. Williams, Mike Klopf & The Jefferson Lab Team
Jefferson Lab
Newport News, Virginia 23606

At Jefferson Lab we operate a superconducting linac with continuous-wave radio-frequency excitation to produce 135 pC sub-ps bunches of electrons at repetition rates



up to 75 MHz. CSR, or multiparticle coherently enhanced emission is produced by modulating this bunch in a Free Electron Laser cavity, and is also produced for wavelengths that are longer than twice the bunch length. With electron beam energies of 100 MeV, the electron beam energy is 1 MW. Therefore we energy recover the electrons in a return loop.

We will describe the operation of the facility, and then applications of this intense beam. The applications fall into 2 categories, real-time imaging, and out-of-equilibrium dynamics.

G.R. Neil et al "The JLab High Power ERL Light Source", Nucl. Instr. & Methods **A557** 9 (2006).

J.M. Klopf, et al., Nucl. Instr. and Meth. A (2007), doi:10.1016/j.nima.2007.08.081.

This work supported by the Office of Naval Research, the Joint Technology Office, the Commonwealth of Virginia, the Air Force Research Laboratory, The US Army Night Vision Lab, and by DOE under contract DE-AC05-060R23177.