

ACCELERATOR SEMINAR

UH-FLUX Project: High Current ERL for Research and Industrial Applications

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The next generation light sources for research and industry are to be compact, highly efficient, have high repetition rates and high-brilliance radiation pulses. To generate high-power, high brilliance beam either in THz or X-ray ranges, a high charge electron beam is required. One of the candidates capable to satisfy all these requirements are LINAC driven light sources which efficiency can be significantly improved by adding energy recovery stage. However, adding the energy recovery stage, while increasing the beam charge and repetition rate, leads to the appearance of beam break-up (BBU) instabilities. This instability arise from use of the same cavity or strongly coupled cavities to achieve energy recovery. Indeed in this case the positive feedback between the transverse momentum imparted by the high order modes (HOMs) and the HOMs amplitude is readily established. To solve the problem, design the high current ERL and build novel compact sources of bright THz and EUV radiation the UH-FLUX has been established. Here the first steps of the project and the most recent results observed will be discussed. The conceptual design of the single turn, asymmetric energy recovery LINAC (AERL) will be shown. We expect that using such a RF cavity design the regenerative BBU instability start current can be significantly increased allowing $> 1A$ average electron beam current to be driven through the system.

Tuesday, September 19, 2017

11:00 a.m.

CEBAF Center, Room L102

Coffee before seminar at 10:45 a.m.