19. Title: Generation and applications of ultra-short electron beams in energy-recovery linacs

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Abstract: Energy-recovery linacs (ERLs) are in operation and under development in the world for future light sources, which cover a wide range of photon energy, from THz to gamma-rays, by using various kinds of photo-emission processes, undulator radiation, free-electron lasers, laser Compton scattering (LCS), and coherent radiation. Availability of ultra-short electron beams is an essential feature of ERLs for future light sources. In this paper, we provide an overview of the generation and applications of ultra-short electron beams in ERLs. Magnetic bunch compression and velocity bunching are the two schemes of ultra-short electron beam generation that are presented with the Compact ERL test facility as an example.