FEL2022



Contribution ID: 237 Contribution code: TUP26

Type: Contributed Poster

Spectral Control of THz Super-Radiant Spontaneous Undulator Radiation Driven by Ultrashort Electron Beam with Energy Spread

Tuesday, 23 August 2022 17:40 (20 minutes)

S.Y. Teng(1,2), S.H. Chen(1), W.Y. Chiang(2), M.C. Chou(2), H.P. Hsueh(2), W.K. Lau(2), A.P. Lee(2), P.T. Lin(3) 1 Department of Physics, NCU, Taoyuan, Taiwan 2 NSRRC, Hsinchu, Taiwan

3 Department of Engineering and System Science, NTHU, Hsinchu, Taiwan.

Intense coherent THz radiation has been generated from an 18-period, hybrid-type U100 planar undulator as it is driven by short relativistic electron pulses produced from the NSRRC photoinjector. However, it is observed that the number of output optical pulse cycles is much less than the number of undulator periods and therefore the radiation spectral bandwidth has been broadened. It is found that the dispersion of undulator with excessive energy spread is responsible for this undesired broadening of THz radiation spectrum. In this study, instead of using rectilinear rf bunch compression (i.e. velocity bunching) in photoinjector linac, we investigate the feasibility of using nonlinear magnetic bunch compression for spectral bandwidth control of coherent THz undulator radiation.

I have read and accept the Privacy Policy Statement

Yes

Primary authors: TENG, Shan You (Department of Physics, National Central University); CHEN, Shih-Hung (Department of Physics, National Central University); Dr LEE, An-ping (National Synchrotron Radiation Research Center); Dr CHOU, Ming-Chang (National Synchrotron Radiation Research Center); Dr HSUEH, Hsin-Pai (National Synchrotron Radiation Research Center); Dr CHIANG, Wei-Yuan (National Synchrotron Radiation Research Center); LAU, Wai-Keung (National Synchrotron Radiation Research Center); Mr LIN, Pao Ting (National Tsing Hua University)

Presenters: TENG, Shan You (Department of Physics, National Central University); CHEN, Shih-Hung (Department of Physics, National Central University); Dr LEE, An-ping (National Synchrotron Radiation Research Center); Dr CHOU, Ming-Chang (National Synchrotron Radiation Research Center); Dr HSUEH, Hsin-Pai (National Synchrotron Radiation Research Center); Dr CHIANG, Wei-Yuan (National Synchrotron Radiation Research Center); LAU, Wai-Keung (National Synchrotron Radiation Research Center); Mr LIN, Pao Ting (National Tsing Hua University)

Session Classification: Tuesday posters

Track Classification: Novel acceleration and FEL concepts