



Iranian Journal of Physics Research, Vol. 18, No. 3, 2018

Enhancement of terahertz radiation from laser-bunched electron beam in a helical wiggler with axial magnetic field

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(Received 30 January 2016 ; in final form 08 March 2018)

Abstract

The generation of coherent terahertz (THz) radiation produced from moving the relativistic electron beam through a helical wiggler with axial magnetic field is studied here. The relativistic electron beam is modulated via the interaction with the beat wave of two laser beams that have frequency difference in the THz range. When the modulated relativistic beam of electrons move through the helical wiggler with the axial magnetic field, it radiates coherent THz electromagnetic wave as an antenna. In addition, the numerical study shows the maximum THz power increase with the enhancing the axial magnetic field power.

Keywords: free electron laser, helical wiggler, axial magnetic field, laser-bunched electron beam

For full article, refer to the Persian section