

P4.2002 Matching laser frequency to electron energy for a Thomson source

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See the full abstract here:

<http://ocs.ciemat.es/EPS2019ABS/pdf/P4.2002.pdf>

A Thomson source generates high energy radiation by colliding a laser pulse with an electron beam. This process can be described fully by classical electrodynamics [1]. The bandwidth of the emitted radiation depends, amongst others, by the energy spread of the electrons. When the energy spread is correlated a chirp can be introduced on the laser pulse such that the frequency of the laser is matched to the energy of an electron. Two different geometries have been investigated: an energy spread along propagation and in the transverse direction. For both geometries the bandwidth of the emitted radiation can be reduced to that of the case of a monochromatic electron beam.

References

[1] A. I. Nikishov and V. I. Ritus, Sov. Phys. JETP, 19, 529-541 (1964)

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