The Beams and Applications Seminar Series

Transverse-Longitudinal Phase-Space Manipulations and Correlations

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ANL/ASD

Bldg. 401, rm B2100
Friday, January 20, 1:30 pm

Host: C.-x. Wang, ASD

We will discuss manipulations on transverse and longitudinal phase-space distribution of an electron beam and their applications. Symplecticity of a Hamiltonian system requires that the emittance of a subspace can be partially transferred to other subspace only in the presence of correlation. We present an optical system producing an exact transverse to longitudinal exchange. A few examples are presented: transverse-longitudinal emittance exchange to improve performance of a high-gain free-electron laser (FEL) for hard x-rays, and the flat beam technique and its application to compact Terahertz devices and ultrashort-pulse generation. It is shown that emittance transfer to some degree would be advantageous for FELs. Also, it is shown that transverse-longitudinal correlations would be advantageous for FELs. Conventional and exotic methods of producing such correlations are described.

For more information visit
http://www.aps.anl.gov/asd/physics/seminar.html

Visitors from off-site please contact Chun-xi Wang
(wangcx@aps.anl.gov, 630-252-4968) to arrange for a gate pass.

This ANL seminar series is a CARA activity and focuses on the physics, technology and applications of particle and photon beams. It is sponsored jointly by the ASD Division, the AWA group of the HEP Division, and the ATLAS group of the PHY Division.