Joint DESY and University of Hamburg Accelerator Physics Seminar

Monday, May 02, 2005

(10:00 in Room 459/30b)

Accelerator Physics Aspects of Crab–Cavity–Based Production of Picosecond X–ray Pulses

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APS

Abstract

Recently, Zholents et al. proposed applying to the Advanced Photon Source an x–ray compression scheme based on a pair of vertically–deflecting crab cavities and asymmetric cut crystals. We have explored the feasibility and potential performance of this scheme. Using the simulation program ELEGANT as well as analytical methods, we have reached an understanding of various possible causes of vertical emittance growth. We also explored tolerances on alignment, phase, and voltage of the cavities; lifetime effects; tradeoffs between cavity frequency and voltage; and performance with slicing alone instead of compression. Our conclusion is that x–ray pulse lengths of about 1 ps rms should be feasible and are consistent with normal operation of the APS.

NOTE THE UNUSUAL DATE AND TIME

D.P.Barber (MPY), J.Rossbach (Univ. HH) and M.Vogt (MPY).

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