Joint DESY and University of Hamburg Accelerator Physics Seminar

Tuesday, 29.01.2013

(16:00 in Room 459/30b)

Tracking of a PETRA-III Positron Bunch with a Precomputed Wake Matrix Due to Electron Clouds

Aleksandar Markovik

Uni Rostock

Abstract

At the synchrotron radiation facility at DESY transversal tune spectra have been observed which are characteristic for an interaction of the positron beam with possible electron clouds in the ring. The filling patterns at which these incoherent tune shifts happen are favorable to the growth of the electron cloud density, i.e. long bunch trains with short intra–bunch distances. Eventually the vertical emittance growth with the originally designed equidistant filling (with 8 or 16 ns bunch spacing) has been avoided by fillings with short bunch trains and longer gaps between them and yet achieving the designed beam current of 100 mA. We examine the positron bunch stability of PETRA–III for certain e–cloud densities and bunch parameters. A PIC simulation of the interaction of the bunch with an e-cloud yields the wake kick on the tail particles for an offset in the vertical centroid position of the head parts. With such a pre-computed wake matrix, we investigate the stability of a single bunch by tracking it through the linear optics of the ring while at each turn applying the kick from the e-cloud. The simulation results are in a good agreement with the measurements.

Measurements of Complex Structures' RF Properties and their Simulation by means of Concatenation Techniques

Thomas Flisgen

Uni Rostock

Abstract

The prediction of complex structures' RF properties by means of numerical modeling is a crucial task in accelerator physics. The presentation is divided into two parts. The first part discusses the computation of the scattering parameters of FLASH's third harmonic module ACC39 by employment of concatenation techniques. For the sake of model validation, measurements at the FLASH facility have been conducted. Details of the measurements are presented and a comparison between measured and simulated scattering parameters is shown. The second part of the talk presents the improvement and the generalization of the concatenation scheme, such that redundancy in the formulation is reduced and other secondary quantities (e.g. external quality factors or transient system responses) can be computed.

J.Roßbach (Univ. HH) and M.Vogt (MFL).

Visit our web site at `http://www-mpy.desy.de/AccPhySemDESY/index.html`