Joint DESY and University of Hamburg Accelerator Physics Seminar

Thursday, 25.09.2014

(16:00 in Room 459/30b)

The Fully Polymorphic Package (FPP) and the Polymorphic Tracking Code (PTC)

Etienne Forest

KEK

Abstract

This talk explains the philosophy behind FPP and PTC.
FPP is a Fortran90 library which has two parts:
1: It wraps the old package of M. Berz and a complex version of it into a polymorphic type which can change from REAL to Taylor at execution time; and
2: it has analysis routines for Taylor maps made of an orbital part, a stochastic part (quadratic only) and a spin part.

FPP embodies in software the author's views on how Courant-Snyder theory should be rewritten so as to unify linear, nonlinear motion and spin in one universal "Twiss" loop which is compatible with an integrator code.

PTC is just an integrator. It makes use of FPP so that perturbation theory is trivially accessible. It also contains a new definition of a beam line which was scandalously missing in the Classic project of CERN and which led to the defunct MAD9. This permits the simulation of arbitrary topologies within the lens paradigm.

The author hopes to illustrate these concepts while humbly admitting that more gifted programmers, if they learn the (mathematical) physics, could do much better.

NOTE THE UNUSUAL DATE

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

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