

**General Particle Tracer: A 3D Code for Accelerator and Beam Line Design,**  
S.B. VAN DER GEER, M.J. DE LOOS, PULSAR PHYSICS, Utrecht - The General Particle Tracer (GPT) code is a well established simulation platform for the study of charged particle dynamics in electromagnetic fields. Because of its modern implementation, GPT can be conveniently customized without compromising its ease of use, accuracy or simulation speed. The code is completely 3D, including the space-charge model. In this paper we will present the latest version of GPT, version 2.40. This newest release is capable of simulating different types of particles simultaneously, includes many new elements, can calculate scattering statistics based on 3D ray tracing techniques and is twice as fast. The new integration method is based on a fifth order embedded Runge-Kutta method with adaptive stepsize control to ensure both accuracy and speed in solving the particle's equations of motion in time domain. Furthermore any additional differential equations can be solved while tracing the particles. GPT features also include complete freedom in the initial particle distribution and the flexibility to position and orient all beam line components. Separate utility programs calculate macroscopic quantities, produce ascii/graphical output and automate parameter scans. We report on the internal structure of the General Particle Tracer and simulation results demonstrating its capabilities will be presented.