AUTOMATED BEAM STEERING SOFTWARE

Keith Engell
Fermilab, USA

Abstract

With the construction of the Main Injector (MI) and Recycler (RR) in the final stages, the newly created beam lines to support these accelerators as well as the existing beam lines, which were modified for the project, are receiving much attention. While examining existing Automated Beam Steering (ABS) software for FNAL's accelerators and beam lines it was obvious that new software was needed. The Beam Line Analysis and Systematic Tuning (BLAST) software is currently under development to meet these needs.

BLAST differs from previous ABS software in a number of ways. BLAST is not being written to 'solve' the problems of one particular beam line. Instead it is designed as an infrastructure for current and future ABS needs. This infrastructure includes a software library of routines for data acquisition, client-server components, and algorithms. Also BLAST provides software for reading and writing to SYBASE database tables which store optics data, tuning information and data acquired while 'interrogating' a beam line. BLAST supports data logging of calculated settings, which is useful for long term tracking of beam line power supplies, magnets and failures in the BLAST system. The BLAST infrastructure also provides the user community with a consistent set of applications. Multiple steering modes of a beam line are provided by BLAST. These modes are: Interrogation-for studying a beam line; Pathfinder-for commissioning or start up (after a shutdown); Manual - for testing of BLAST; Open loop-for operator assisted tuning; Automatic - for normal server mode operations. The integration of theoretical modeling software such as MAD and TRANSPORT into the BLAST architecture is also a goal.