

SPS and LHC Tune Control Studies using the "Fast Map" Tool, L. JENSEN, R. JONES, H. SCHMICKLER, CERN; A. BUDZKO, S. KOSCIELNIAK, TRIUMF - It is proposed to continuously excite and measure the coherent betatron tunes in the LHC and the chromaticity by modulation of the beam energy or monitoring the head-tail phase-shift. Of particular interest for later on-line tune control is the question "How do time-variable non-linearities of the LHC magnets (snap-back, etc.) affect these measurements?" In order to answer this question seven years before the date of commissioning, a computer beam model is required to stand in place of the real charged particle beam. "Fast Map" (FM) is a transfer-map iterating engine that has been written and optimized for high-speed tracking of particles (using COSY-generated maps) and customized to allow an unlimited number of tuning parameters (quadrupole and sextupole strengths, etc.) in addition to the six kinematic variables. FM has been interfaced with an off-line tune-measurement simulator that chooses the strengths of magnetic lattice elements. It is intended to make a 'dress-rehearsal' of the tune measurement scheme in the SPS before applying it to the LHC. In this paper we describe some features of FM and its application to beam diagnostics studies in the SPS and LHC.