



Contribution ID: 185

Type: Oral

## ICOSIM++: a Simulation Tool for Crystal Aided Collimation Experiments

*Friday, 10 October 2014 11:30 (15 minutes)*

UA9 is the crystal-assisted collimation experiment at CERN. In the SPS this experiment successfully demonstrated that bent crystals can work as “smart deflectors” on primary halo particles. The final goal is to use this technique for LHC collimation. A prototype of crystal aided collimation system was installed in the LHC in March 2014. To understand thoroughly the experimental data, and to prepare the future UA9 experiment in LHC, the simulation of the beam collimation process is a fundamental ingredient. Here we present the C++ based tracking code ICOSIM++ that was specifically designed to simulate the collimation of a particle beam in a circular accelerator. The interaction of the beam halo particles with the collimators is treated either by calling tabulated cross-sections or by a call to FLUKA. An interface connecting ICOSIM++ to a Fortran routine simulating the interaction of a proton with a crystal has been added recently. This makes ICOSIM++ an ideal and flexible tool to study crystal collimation. Furthermore, the energies and trajectories of the lost particles are registered for further analysis. Tracking simulation results for the SPS will be shown and compared with SixTrack simulation results.

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**Session Classification:** S6: Crystal Simultaion Routines for Particle Accelerators : Comparison and Benchmarking with Experimental Data