



## *Séminaire du Laboratoire de l'Accélérateur Linéaire*

**Enrico Bagli**

INFN & University of Ferrara

**Mardi 13 Janvier 2015 à 11 :00**

## **Integration of orientational coherent effects of ordered structures in Geant 4**

Research on interaction of either charged or neutral particles with crystals underwent tremendous boost in the last years due to the availability of novel technologies in the fabrication of the crystal for experiments and the improvement in detection techniques. Coherent effects of ultra-relativistic particles in crystals allow the manipulation of particle trajectories thanks to the strong electric field generated by crystal planes and axes. Various applications of orientational phenomena with crystals have been proposed and investigated such as beam steering extraction and collimation in circular accelerators, splitting and focusing of external beams. Coherent effects in the interaction of particles with aligned structures have always exploited the opportunities furnished by the most advanced computers and computational methods of the current period. Nowadays Monte Carlo simulations of the interaction of particles with matter are usually done with download-able toolkits, e.g., Geant4, whose capabilities are continuously expanded and improved. By adopting the continuous potential approximation, a model for simulation of orientational effects in straight and bent periodic atomic structures has been developed and integrated into Geant4. The model allows to precisely track the particle trajectories that take place in straight and bent crystals and the scaling of the cross sections for hadronic and electromagnetic processes of channeled particles. The code has been validated against data from channeling experiments carried out at the H8-SPS external line in CERN and at the Mainz Microtron (MAMI).

**Salle 101 du LAL - Bât. 200, Orsay**

Thé et café seront servis 5 mn avant le séminaire



Responsable : N. Delerue (seminaires@lal.in2p3.fr)- <http://www.lal.in2p3.fr>