



**AN OBJECT-ORIENTED SIMULATION CODE
FOR CHANNELING RADIATION OF
ULTRARELATIVISTIC ELECTRONS**

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WHAT IS FOTPP ?

- An object-oriented version (C++) of the fortran simulation code FOT for electron and positron channeling at ultrarelativistic energies (by Xavier Artru, Nucl. Instr. and Meth. B48 (1990) 278-282)
- Advantages of Object-oriented programming :
 - Safety, modularity, and versatility
 - Easy evolution (simulation with various crystals)
- Use of Standard Template Library : strings, containers (vectors)
- COMMON fortran become C++ classes
- Original algorithm is kept
- Ready for specific integration in GEANT4 (cf O. Dadoun's talk)



THE CLASSES

- class **Fot** implements the phenomenon of channeling
- class **Crystal** defines a crystal with a predefined structure
- class **Evenement** implements the treatment of a single particle
- class **Particle** provides data and methods for a particle (electron or positron)
- class **ParticleCollection** provides a collection of particles
- class **Photon** creates a photon emitted by a particle in the crystal
- class **PhotonCollection** creates a collection of photons



THE CLASSES (...)

- class **Lindhard** computes potentials and Lindhard force
- class **Snake** models the trajectory of the particle in the crystal and manage emissions of photons (generation of Kumakhov photons)
- class **BremsStrahlung** controls the multiple scattering and the emission of photons of bremsstrahlung
- class **RunParameters** gathers input parameters for the run
- class **statistiques** gathers statistical data of the run



TEST : COMPARISON OF FOT AND FOTPP

