

Automatic code generation for scientific computing

Petrov Konstantin,

Linear Accelerator Laboratory,

National Institute of Nuclear and Particle Physics

9 rue laplace, Paris 75005, France

We present our recent work on implementing Domain Specific Language for use in Monte-Carlo simulations. The language, called QIRAL, is designed to be as close to scientific representation of the problem as possible. The higher level representation is done in LaTeX and comprises of the part describing the Lagrangian and the part describing iterative solution method. The QIRAL then produces C code along with OpenMP pragmas to be linked together with appropriate low-level primitives library. The performance is comparable to the vanilla hand-written code but allows for experimentation with various data layouts, potentially improving the performance on novel architectures.