Accelerating the World's Largest Accelerators

Konstantinos ILIAKIS

Abstract

- CERN – European Organization for Nuclear Research
- Doctoral Student with NTUA as supervising university
- Computer architecture and hard/soft-ware HPC techniques to accelerate complex simulators

BLonD (I)

- <u>B</u>eam <u>Lon</u>gitudinal <u>D</u>ynamics code simulator
- Developed in Python with C extensions for the computational kernels
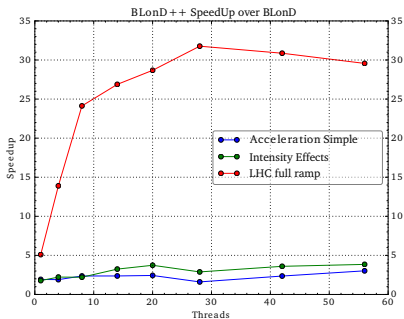- More than ten contributors, numerous users at CERN and KEK-Japan

LHC Blow-up

PS-SPS Transfer

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BLonD++

- BLonD++ is the C++ version of BLonD
- Native support for multi-threading, auto-vectorization, compiler optimizations etc
- Proved to perform better in complex simulations

BLonD++ SpeedUp over BLonD

Legend:
- Acceleration Simple
- Intensity Effects
- LHC full ramp

Future Studies

Thank you all for your attention!