



Contribution ID: 209

Type: oral presentation

## Optimisation of the ATLAS Track Reconstruction Software for Run-2

*Monday 13 April 2015 14:00 (15 minutes)*

Track reconstruction is one of the most complex elements of the reconstruction of events recorded by ATLAS from collisions delivered by the LHC. It is the most time consuming reconstruction component in high luminosity environments. After a hugely successful Run-1, the flat budget projections for computing resources for Run-2 of the LHC together with the demands of reconstructing higher pile-up collision data at rates more than double those in Run-1 (an increase from 400 Hz to 1 kHz in trigger output) have put stringent requirements on the track reconstruction software. The ATLAS experiment has performed a two year long software campaign which aimed to reduce the reconstruction rate by a factor of three to meet the resource limitations for Run-2: a major part of the changes to achieve this were improvements to the track reconstruction software and will be presented in this contribution. The CPU processing time of ATLAS track reconstruction was reduced by more than a factor of three during this campaign without any loss of output information of the track reconstruction.

We present the methods used for analysing the tracking software and the code changes and new methods implemented to optimise both algorithmic performance and event data. Although most improvements were obtained without dedicated targetting concurrency strategies, major parts of the ATLAS tracking software were updated to allow for future improvements based on parallelism which will also be discussed.

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**Session Classification:** Track 2 Session

**Track Classification:** Track2: Offline software