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Derived Physics Data Production in ATLAS: Experience with Run 1 and Looking Ahead

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While a significant fraction of ATLAS physicists directly analyse the AOD (Analysis Object Data) produced at the CERN Tier 0, a much larger fraction have opted to analyse data in a flat ROOT format. The large scale production of this Derived Physics Data (DPD) format must cater for both detailed performance studies of the ATLAS detector and object reconstruction, as well as higher level and generally lighter-content physics analysis. The delay between data-taking and DPD production allows for software improvements, while the ease of arbitrarily defined skimming/slimming of this format results in an optimally performant format for end-user analysis.

Given the diversity of requirements, there are many flavours of DPDs, which can result in large peak computing resource demands. While the current model has proven to be very flexible for the individual groups and has successfully met the needs of the collaboration, the resource requirements at the end of Run 1 are much larger than planned. In the near future, ATLAS plans to consolidate DPD production, optimising resource usage vs flexibility such that the final analysis format will be more homogeneous across ATLAS while still keeping most of the advantages enjoyed during Run 1.

The ATLAS Run 1 DPD Production Model is presented along with the resource usage statistics at the end of Run 1, followed by an outlook for future plans.

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