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Abstract The ROOT system provides a set of OO frameworks with all the functionality needed to handle and analyze large amounts of data in a very efficient way. Having the data defined as a set of objects, specialized storage methods are used to get direct access to the separate attributes of the selected objects, without having to touch the bulk of the data. Included are histogramming methods in an arbitrary number of dimensions, curve fitting, function evaluation, minimization, graphics and visualization classes to allow the easy setup of an analysis system that can query and process the data interactively or in batch mode, as well as a general parallel processing framework, PROOF, that can considerably speed up an analysis. In addition, ROOT offers an ensemble of advanced mathematical functions such as Bessel and Airy functions or distributions such as Landau, gamma, Cauchy or Breit-Wigner. These functions are relevant for a variety of performance critical applications, among which the statistical studies in HEP such as discoveries and exclusions. This kind of activities will be more and more important during the forthcoming 13 TeV collisions at the LHC.

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