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Analysis Description Language for LHC-type analyses

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Physicists aiming to perform an LHC-type analysis today are facing a number of challenges: intense computing knowledge is needed at programming level to implement the relevant algorithm, and at system level to interact with the ever evolving sets of analysis frameworks for interfacing with the analysis object information. Moreover, the ambiguity concerning the configuration of the overall computing environment impairs the reproduction of previous results. To overcome at least some of these difficulties, we propose the utilization of an Analysis Description Language (ADL), a domain specific, declarative language capable of describing the contents of an LHC analysis in a standard and unambiguous way, independent of any computing framework. Such a language decouples the computer intense aspects such as data access from the actual physics algorithm. It would therefore benefit both the experimental and phenomenological communities by facilitating the design, validation, combination, reproduction, interpretation and overall communication of the analysis contents. It would also help to preserve the analyses beyond the lifetimes of experiments or analysis software. This presentation aims to introduce the ADL concept and summarize the current efforts to make it realistically usable in LHC analyses. In particular, the work that has been ongoing to develop transpiler and interpreter systems adl2tnm and CutLang, to implement various example analyses as well as documentation and validation efforts will be presented.

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