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Particle physics MasterClasses and future developments

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The International project physicsmasterclasses.org brings the excitement of cutting-edge particle-physics research into the classroom including hands-on experience with real experimental data. In 2018 about 15 000 students, 15 to 19 years of age, participated in this popular event over 6 weeks in 52 countries, hosted by 225 institutes. The existing LHC masterclasses are used in many other occasions while communities beyond LHC also start implementing their analyses (e.g. IceCube, Belle...).

I will discuss a proposal towards developing a general, experiment independent framework that could allow the implementation of further masterclasses in an economic way for developers and could ensure easy use at different environments.

As a first step, a CERN summer student project was dedicated at improving and expanding the current ALICE masterclass, developed in 2010 based on ROOT, with the goal to structure and prepare a framework for future developments. The next steps aim at using data from different experiments but also introducing new analyses and data samples.

A more ambitious part of the project will focus on taking advantage of powerful tools for browser based data analysis such as the ones that are becoming available within ROOT. Browser-based masterclasses would greatly improve easy-of-use, as no installation of software is required. Browser-based 'notebooks' can either run via the CERN SWAN service, or a SWAN service can be deployed on local resources. In this phase of the project, the possibility to run a masterclass as a browser-based notebook will be explored, with the goal of implementing a 'pilot' masterclass.

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Session Classification: Invited Talks