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EVE-7 and FireworksWeb: The next generation event visualization tools for ROOT and CMS

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The CMS experiment supports and contributes the development of next-generation Event Visualization Environment (EVE) of the ROOT framework with the intention of superseding Fireworks, the physics analysis oriented event display of CMS that was developed ten years ago and has been used for Run 1 and Run 2, with a new server-web client implementation. This paper presents progress in development of EVE-7 visualization library and FireworksWeb prototype application.

EVE-7 is a rewrite of EVE for the ROOT-7 era, using modern C++ and relying on ROOTs built-in http server for communication with GUI clients. Part of EVE-7 is also implemented in JavaScript and uses OpenUI5, JSROOT, and Three.js as its foundation libraries.

FireworksWeb is currently at the stage of a minimal application built around EVE-7. Several advanced Fireworks features have been ported into EVE-7 in an experiment-independent manner, relying heavily on Cling, the C++ interpreter of ROOT: dynamic table views, handling of physics object collections, and filtering of objects within physics collections.

Examples from EVE-7 and FireworksWeb will be given to explain and to demonstrate the building of graphical scenes and table views from physics collections, event navigation, and the selection and highlight of physics objects and all their representations.

Consider for promotion

Yes

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