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PocketCoffea: a configuration layer for CMS analyses with Coffea

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A configuration layer for the analysis of CMS data in the NanoAOD format is presented. The framework is based on the columnar analysis of proton-proton collision events with the Coffea Python package and it focuses on configurability and reproducibility of analysis tasks.

All the operations needed to extract the relevant information from events are performed by a Coffea processor object that takes the NanoAOD events as input and returns a set of output histograms or arrays.
PocketCoffea defines a configuration scheme to specify all the parameters and settings of the processor: the datasets definition, object and event selections, Monte Carlo weights, systematic uncertainties and the output histograms characteristics. The configuration layer is user friendly and speeds up the setup of many common analysis tasks.
A structured processor performing operations that are common among CMS analyses is defined and can be customized with derived processor classes, allowing code sharing between different analyses workflows in a hierarchical structure.
With its configurable structure, PocketCoffea is a suitable tool to perform any CMS analysis in a highly reproducible, computational efficient and user-friendly way.

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