

An update on CMS analysis pipelines through the Integration Challenge

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Analysis workflows for the High-Luminosity LHC (HL-LHC) will need to handle far more data than current approaches were designed for. To prepare for this, CMS analysis pipelines are being built on the scientific Python stack, with HEP-specific tools filling the gaps where general-purpose software falls short. This talk gives an update on that effort through the lens of the Integration Challenge, an IRIS-HEP initiative that tests the software stack and analysis facilities under realistic conditions before the HL-LHC era begins.

Rather than testing components in isolation, the Integration Challenge runs a realistic physics analysis from start to finish, exposing how well the tools work together and what the experience feels like for an analyst. Because the surrounding ecosystem keeps moving, the challenge has to move with it: a recurring theme of recent work has been picking up new capabilities from *coffea* and the Scikit-HEP libraries and working them into the pipeline. We discuss what this continuous integration of ecosystem developments looks like in practice, and outcomes from integrating new features into the workflow.

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