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Facilitating the deployment and exploitation of HEP Phenomenology codes using INDIGO-Datacloud tools

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The MasterCode collaboration (http://cern.ch/mastercode) is concerned with the investigation of supersymmetric models that go beyond the current status of the Standard Model of particle physics. It involves teams from CERN, DESY, Fermilab, SLAC, CSIC, INFN, NIKHEF, Imperial College London,King's College London, the Universities of Amsterdam, Antwerpen, Bristol, Minnesota and ETH Zurich.

Within the MasterCode collaboration, state-of-the-art HEP Phenomenology codes are consistently combined to provide the most precise prediction for supersymmetric models to be confronted with experimental data.

Generally speaking, for the type of software developed in HEP Phenomenology, there is a lack of tools to enable the easy development and deployment of applications. Phenomenology applications have many dependences in terms of libraries and compilers that makes it difficult to deploy on traditional batch clusters due to system software version conflicts and related issues.

In this work we propose a framework based on the developments of the project INDIGO-Datacloud to fill this gap. In particular such developments allow us to easily build, modify, distribute and run Mastercode in containerized form over multiple Cloud infrastructures.

Other advanced capabilities imply running Mastercode through dynamically instantiated batch systems provisioned by general computing infrastructures. In particular, making possible the automatic handling of parametric runs (parameter sweeping).

Such an advanced computing framework has the potential of speeding up the phases of development and deployment of complex scientific software used in our research, with the corresponding impact in the results.

Tertiary Keyword (Optional)

Secondary Keyword (Optional)

Cloud technologies

Primary Keyword (Mandatory)

Software development process and tools

Primary authors: Mr LOPEZ GARCIA, Alvaro (CSIC); BAGNASCHI, Emanuele Angelo (DESY Hamburg); CAMPOS PLASENCIA, Isabel (Consejo Superior de Investigaciones Científicas (CSIC) (ES)); Mr ORVIZ FERNANDEZ, Pablo (CSIC); HEINEMEYER, Sven (CSIC (Santander, ES))

Presenters: BAGNASCHI, Emanuele Angelo (DESY Hamburg); CAMPOS PLASENCIA, Isabel (Consejo Superior de Investigaciones Científicas (CSIC) (ES))

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