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Particle Physics Analysis with the CERN Open Data Portal

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A framework for performing a simplified particle physics data analysis has been created. The project analyses a pre-selected sample from the full 2011 LHCb data. The analysis aims to measure matter antimatter asymmetries. It broadly follows the steps in a significant LHCb publication where large CP violation effects are observed in charged B meson three-body decays to charged pions and kaons. The project is a first-of-its-kind analysis on the CERN open portal as its students are guided through elements of a full particle physics analysis but use a simplified interface. The analysis has multiple stages culminating in the observation of matter anti-matter differences between Dalitz plots of the B+ and B- meson decay. The project uses the open source Jupyter Notebook project, the Docker open platform for distributed applications, and can be hosted through the open source Everware platform. The target audience includes advanced high school students, undergraduate societies and enthusiastic scientifically literate members of the general public. The public use of this data set has been approved by the LHCb collaboration. The project plans to launch for the public in summer 2016 through the CERN Open Data Portal. The project development has been supported by final year undergraduates at the University of Manchester, Yandex school of data analysis and the CERN Open Data team.

Tertiary Keyword (Optional)

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Preservation of analysis and data

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