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A Gauge Model of Data Acquisition

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Traditionally, in the pre-LHC muti-purpose high-energy experiements the diversification of their physics programs has been largely decoupled from the process of the data-taking - physics groups could only influence the selection criteria of recorded events according to predefined trigger menus. In particular, the physics-oriented choice of subdetector data and the implementation of refined event selection methods have been made in the offline analysis. The departure point of the Gauge Model of the Data Acquisition is that such a scheme cannot be continously extended to the LHC environment, without significant sacrifices in the scope and in the quality of the experimental program. The model is contructed in close analogy to the construction of the gauge models in particles physics and is based upon the dynamic event-by-event, steering of the format and content of the detector raw data, dynamic configuration of the High-Level-Trigger selection algorithms and Physics-goal-oriented slices of processor farms. In this tals I shall present the advantages and drawbacks and of such a model of the data taking architecture for the physics program of the LHC collider.

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