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The CMS electromagnetic calorimeter reconstruction software: requirements from physics and design aspects

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The design goal of the CMS electromagnetic calorimeter is to reach an excellent energy resolution; several aspects concur to the fulfillment of this ambitious goal. An enormous quantity of hardware monitoring data will be available, together with a laser monitoring system that will be able to follow quasi on-line the change of transparency of the crystals due to radiation damage. This result in a big amount of data that needs to be stored in a transparent way in the on-line condition database by on-line monitoring services; part of them needs also to be replicated in the off-line database. Stringent requirements are then made to the database system, in particular for what concern scalability, fast and flexible access and replication of data. Another crucial aspect is represented by the in situ calibration techniques: selected and reduced data needs to be transferred to the calibration farm soon after the data taking, while, afterwards, the possibility of a fast reprocessing of data, when new calibration will be made available, should be envisaged. All these aspects are taken into account in the current design of both condition databases and object-oriented reconstruction software: the design schema will be described, together with the expected flow of information, from raw to reprocessed data.

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