

Novel calibration techniques and their effect on the performance of the CMS tracker in the Legacy reprocessing

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A new, more precise reconstruction algorithm was introduced to recover broken clusters at the edge of the pixel sensors. Many improvements were done in handling the pixel bad components as well: an occupancy based bad component determination was developed, while a dynamical bad component simulation was introduced in MC to handle scenarios with temporary, or permanent issues like failures of DC-DC converters. In the strip detector simulation, a dynamic efficiency loss mechanism was implemented to improve agreement with data. A novel approach to allow the simultaneous fit of an unprecedented number of degrees of freedom was followed in re-aligning the detectors. In this talk, we will present details on the offline calibration procedures and their effects on detector performance in the frame of this Legacy Run-2 data reprocessing, with a special focus on the novel techniques developed for this purpose.

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