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Alignment and detection efficiency of CMS Preshower detector

The Preshower detector, as part of the CMS Endcap electromagnetic calorimeter (ECAL), is designed to have good spatial resolution to measure the position of incoming particles and thus aid particle identification in the endcaps. It comprises two layers of lead absorbers, each followed by silicon strip sensors with 1.9mm pitch. The physics performance of the Preshower relies upon excellent detection efficiency and accurate alignment to the Tracker and the Endcap ECAL crystals. Charged tracks from 7 TeV collisions, reconstructed by the Tracker and extrapolated through the Preshower to the Endcap crystals, are used for this purpose. More than 99.8% of Preshower strips are operational, with a detection efficiency better than 99.5%. The alignment is measured with an accuracy of better than 1mm, meeting the specifications.

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