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Geometrical description of HGICAL in CMS software framework

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The high granularity calorimeter (HGICAL) is an upgrade to the current CMS endcap calorimeters, designed to deal with the severe radiation dosage expected during the high-luminosity LHC. The majority of the HGICAL will be composed of robust and cost-effective 8° hexagonal silicon sensors, with the last five interaction lengths being based on highly segmented plastic scintillators. Multiple full and partial silicon sensors are mounted together with electronics and cooling to form structures called cassettes, which are further attached together to form each of the 47 layers of HGICAL. For optimal electronic connections, it has been decided that the sensors will be placed in different orientations inside a cassette. The hexagonal readout cells inside the sensors break their rotation symmetry, requiring new definitions for different sensor orientations. We have devised a method to properly orient all silicon sensors to the geometry description of HGICAL in the CMS software framework. We have also added the feature of providing cassette shifts for a more accurate representation of the HGICAL geometry with realistic clearances. The talk will discuss both these efforts in detail.

Session

Future Experiments and Detector Development

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