

Measurement of the two track separation capability of hybrid pixel sensors

Large Hadron Collider experiments face new challenges in Run-2 conditions due to the increased beam energy, the interest for searches of new physics signals with higher jet p_T and the consequent longer decay length of heavy hadrons. In this new scenario, the capability of the innermost pixel sensors to distinguish tracks in very dense environment becomes crucial for efficient tracking and flavour tagging performance. In this talk, we discuss the measurement of the two track separation capability of hybrid pixel sensors using the interaction particles out of the collision of high energy pions on a thin copper target. With this method we are able to evaluate the effect of merged hits in the sensors under test due to tracks closer than the sensor spatial granularity in terms of collected charge, multiplicity and reconstruction efficiency for different incidence angles and relative distances in between the DUT and the target. Two pixel detector technologies, 3D silicon and new planar from the qualification batch of the ATLAS-IBL detector, were studied.

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Track Classification: Semiconductor Detectors