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Pixel detector hybridization and integration with Anisotropic Conductive Films

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The precision-measurement goals for the Linear Collider detectors place strict constraints on the pixel size and the amount of material allowed in the vertex and tracking layers. Low-mass interconnect technologies suitable for small pitch hybridization as well as for the integration of modules are therefore required. An alternative pixel-detector hybridization technology based on Anisotropic Conductive Films (ACF) is under development to replace the conventional fine-pitch flip-chip bump bonding. The new process takes advantage of the recent progress in industrial applications of ACF and is suitable for time- and cost-effective in-house processing of single devices. This new bonding technique developed can also be used for the integration of hybrid or monolithic detectors in modules, replacing wire bonding or solder bumping techniques. This contribution introduces the new ACF hybridization and integration technique, and shows the first test results from Timepix3 hybrid pixel assemblies and from the integration of ALPIDE monolithic pixel sensors to flex circuits.

Time Zone

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