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Detector Systems at CLIC

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The Compact Linear Collider CLIC is designed to deliver e+e- collisions at a center of mass energy of up to 3 TeV. The detector systems at this collider have to provide highly efficient tracking and excellent jet energy resolution and hermeticity for multi-TeV final states with multiple jets and leptons. In addition, the detector systems have to be capable of distinguishing physics events from large beam-induced background at a crossing frequency of 2 GHz. Like for the detector concepts at the ILC, CLIC detectors are based on event reconstruction using particle flow algorithms. The two detector concepts for the ILC, ILD and SID, were adapted for CLIC using calorimeters with dense absorbers limiting leakage through increased compactness, as well as modified forward and vertex detector geometries and precise time stamping to cope with increased background levels. The overall detector concepts for CLIC will be presented. Emphasis will be put on the main detector and engineering challenges, such as: the ultra-thin vertex detector with high resolution and fast time-stamping, hadronic calorimetry using tungsten absorbers, and event reconstruction techniques related to particle-flow analysis and beam background suppression.

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