

Design and performance studies of the electromagnetic calorimeter for STCF

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The Super Tau-Charm Facility (STCF), a new generation electron-positron collider in China, is proposed as a unique platform to study tau-charm physics. The baseline design of the electromagnetic calorimeter (ECAL) is based on pure CsI crystals with avalanche photodiodes readout.

A geometric model design for ECAL consists of 8670 pure CsI crystals with defocus operation will be presented. Based on GEANT4, the performance of ECAL is simulated in detail. We will present a summary of the results of the performance simulation, as well as introduce the software framework and reconstruction algorithm. The peaking luminosity of STCF is beyond $0.5 \times 10^{35} \text{ cm}^{-2} \cdot \text{s}^{-1}$ at $\sqrt{s}=4\text{GeV}$, and the background counting rate reaches an exceedingly magnitude of MHz. We will present the estimation of performance deterioration caused by background and a multi-pulse fit algorithm is developed to deal with the effect.

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