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Preliminary study of the passive machine protection for CEPC

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The energy stored in Circular Electron and Positron Collider (CEPC) is in the order of MJ, which will make the beam pipe and other equipment broken once the beam loses control. Avoiding damage to accelerator is the first priority for machine protection. There are two kinds of protection schemes. One is active protection in which an action should be triggered when a failure signal is detected, such as extracting a beam to dumps. The other is passive protections in which there is no action so response time is not considered, for example, the collimators and shields. CEPC will operate in different operation scenarios: t⊠t , Higgs, W and Z. In this study, beam loss for Higgs mode is investigated. Some fast beam loss can be observed from the SAD simulation, which requires passive protection. The global arrangement of collimator is preliminarily investigated to achieve the passive protection.

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