

# TRD for 2023 CERN TestBeam

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# Motivation and Beam Requirements of TRD for 2023 TB

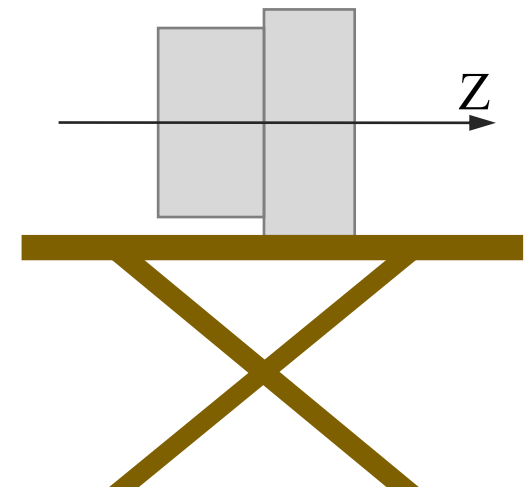
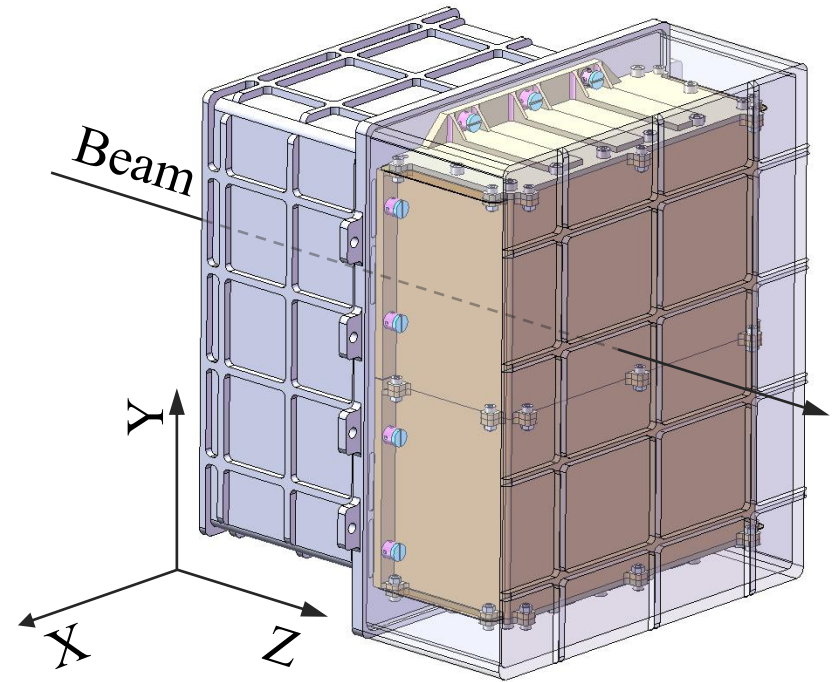
## ❑ Motivation

- ❑ transition radiation response curve of TRD module
- ❑ uniformity scan of large-area radiator TR-yield
- ❑ radiator TR-yield for oblique incidence

## ❑ beam requirement for PS:

- ❑ particle: electron
- ❑ momentum: 0.5 to 5.0 GeV/c, (0.5, 1.0, 2.0, 3.0, 4.0, and 5.0), here, it is necessary to measure the TRD response with and without radiator for electron beams with momentum of 1.0, 3.0 and 5.0 GeV/c
- ❑ statistical: any energy point requires over 20k
- ❑ response curve scanning requires electrons with momentum from 0.5 to 5.0 GeV/c and statistics over 180k
- ❑ uniformity scanning requires electrons with momentum of 3.0 GeV/c and statistics of 320k
- ❑ oblique incidence requires electrons with momentum of 3.0 GeV/c and statistics of 80k

- ❑ TRD: one module(Al)
- ❑ envelope:  $320(X) \times 300(Y) \times 240(Z)$  mm<sup>3</sup>
- ❑ weight: < 20 kg
- ❑ radiation length of TRD along the beam direction:  $0.06 X_0$
  
- ❑ Detector
  - ❑ regular radiator (300 cm<sup>2</sup>): radiator will be ready by June 1
  - ❑ detector : detector will be ready by June 1
  
- ❑ Electronics
  - ❑ one set of front-end electronics and one set of back-end electronics, and ready by June 30



# Planform Requirement

The requirements for the TRD platform are as follows:

- ❑ two-dimensional motion platform
  - ❑ range:  $\pm 10$  cm
  - ❑ step: 0.2 cm
  
- ❑ one-dimensional rotation platform
  - ❑ range:  $\pm 40^\circ$
  - ❑ step :  $1^\circ$

