

KEK Test

Step2

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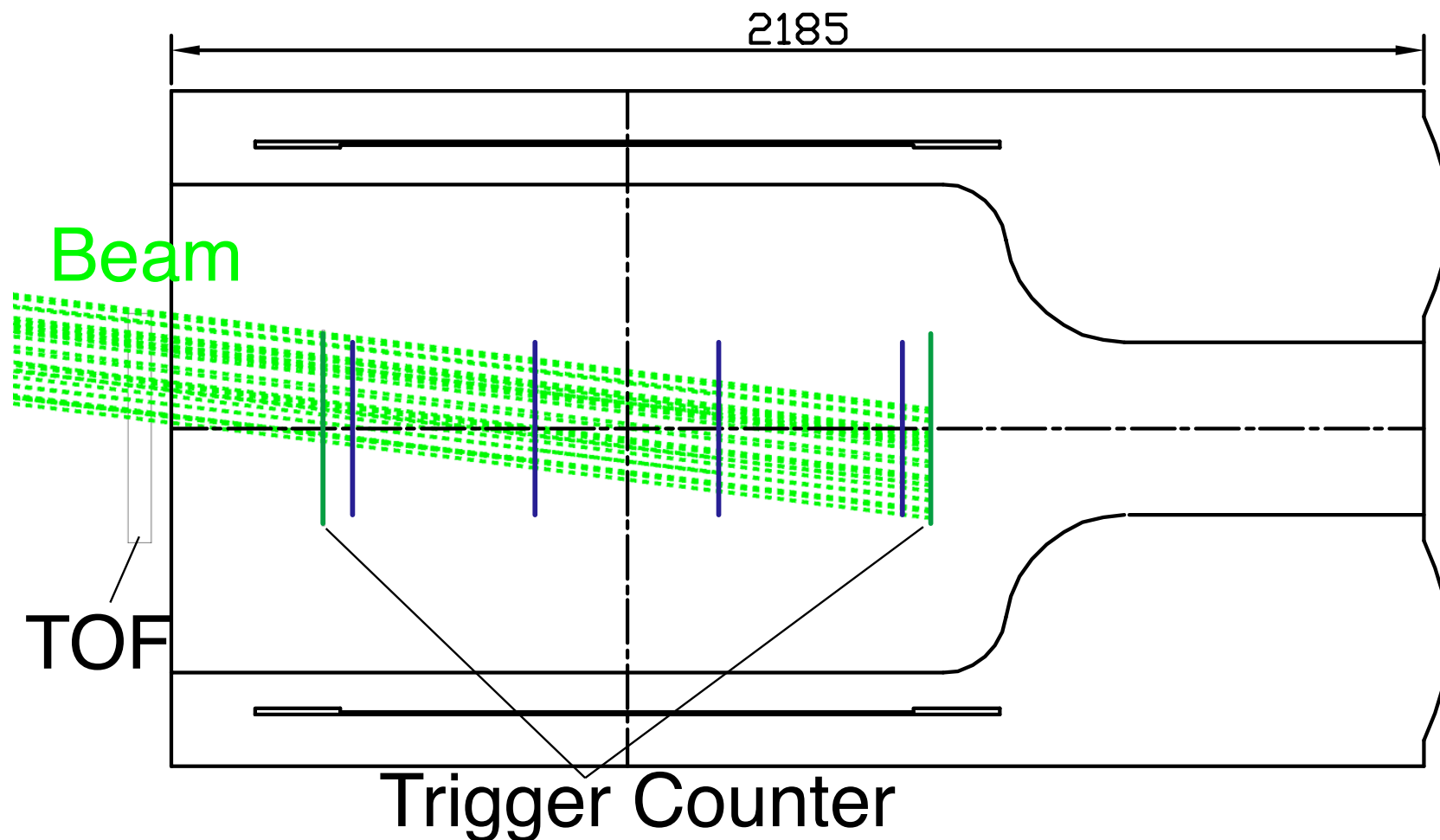
Outline

- What to do in step 2
- Preparation
- Time line

Phase 0

w/o B field, High p

- Check basic performance
 - High precision cosmic-ray test
 - Defocused beam $\phi 300$



Phase 0

Issues #1

- Light Yield
 - 3HF concentration
 - angular dependence
- Dead wire/ch distribution (efficiency)
- Cross talk
 - between adjacent fiber
 - between views
- position alignment
 - relative alignment between station
 - wire position within view

Phase 0

Issues #2

- Rate capability
 - 204 ch / view * 10 view = 2040 ch
 - if 5k ~ 10k events are required,
i.e., 1M~2M events in total for 1 configuration
 - and DAQ time is 1000~2000sec,
 - Then 1 kHz DAQ rate is necessary
(cf. MICE 3 kHz/spill)

Phase 1

w/ B field, low p

- Study tracking performance
 - Defocused beam $\phi 300$
 - $0.2 \text{ GeV}/c \sim 0.6 \text{ GeV}/c$

Phase 1

issues #1

- Precision p measurement
 - angular dependence (pt, roll)
 - momentum dependence 0.2 ~ 0.6 GeV/c
 - Defocused beam $\phi 300$
 - 0.2 GeV/c ~ 0.6 GeV/c
 - Comparison with simulation

Phase 1

issues #2

- How to determine the reference momentum
 - Momentum bite of the pi2 beam line
 - officially 1% but should depend on the slit
 - can be estimated by using TOF as
$$\frac{dp}{p} = \frac{1}{1 - \beta^2} \frac{d\beta}{\beta} = \frac{1}{1 - \beta^2} \frac{\Delta TOF}{TOF}$$
 - T1 resolution : 58psec at 1 GeV/c, 55 psec at 2 GeV/c
 - $\Delta TOF = 58$ psec for $TOF = 34$ nsec
 - $dp/p = 2.8$ %

Phase 1

issues #3

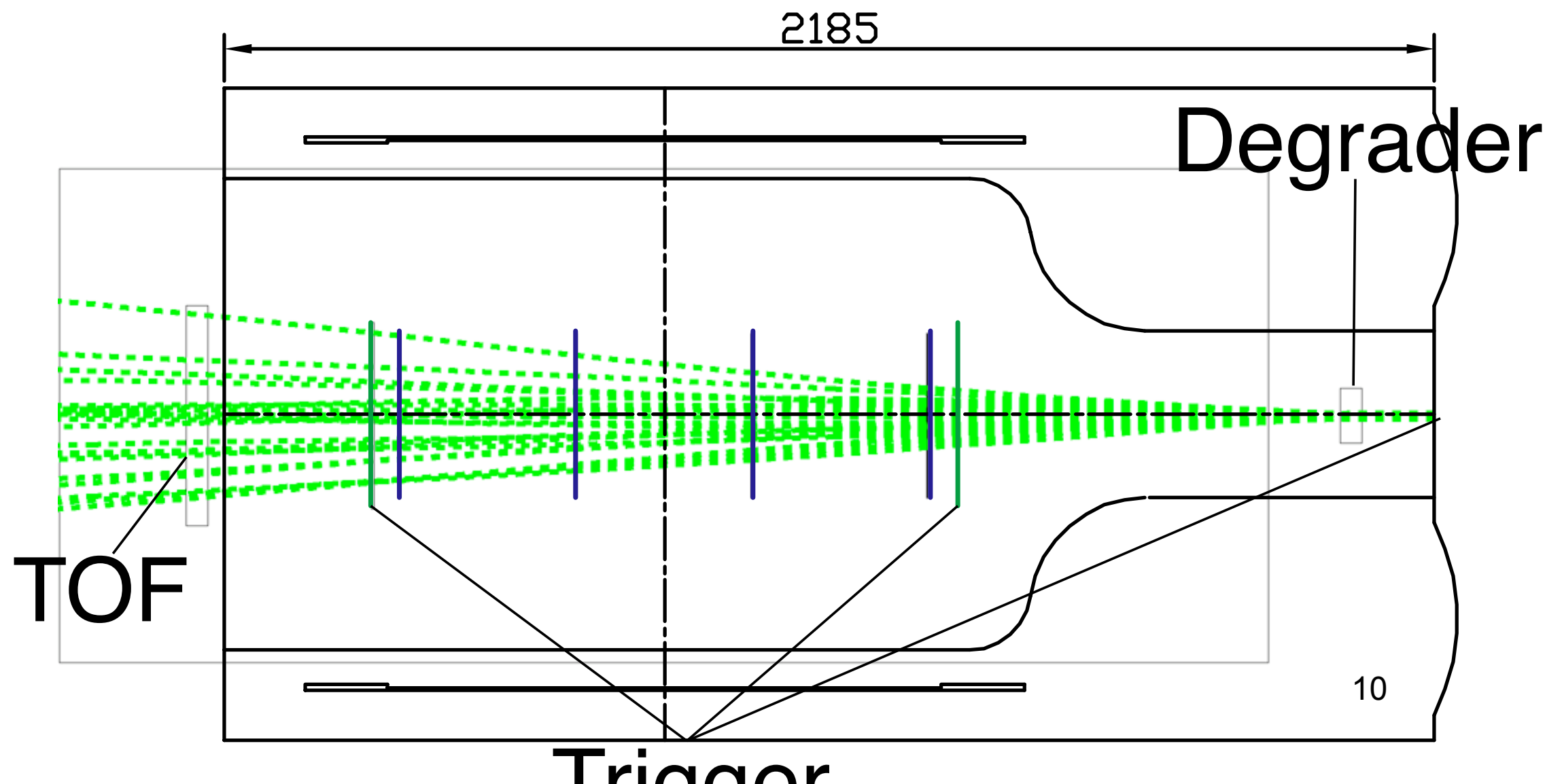
- How to determine the reference momentum?
 - TOF measurement
 - T1 $\sigma=50$ ps, T $\sigma=60$ ps $\rightarrow \sigma(\text{TOF})=66$ ps
 - $p = 300$ MeV/c $\rightarrow dp/p = 1.7\%$
 - $p = 400$ MeV/c $\rightarrow dp/p = 2.9\%$
 - Difficulties
 - Decay in flight $\rightarrow$ Aerogel Cerenkov Counter
 - Path length according to spiral motion in B field
 - Energy loss

Phase 2

w/ large emittance

w/ large emittance

- Study of emittance measurement



Preparation/Status

- TOF
 - Investigation of calibration scheme and TOF res
 - Improve support structure
- Aerogel
 - LED calibration
- Magnet
 - Rotation mechanism
- VLPC
- SciFi Tracker
- DAQ

To be discussed in this meeting

Time line

- July
 - Proposal to be submitted
- August
 - All equipments will be shipped to KEK
 - VLPC and Scifi-tracker setup in PS hall
 - Possible meeting on VLPC and/or DAQ
- September
 - Cosmic-ray test
- September - October
 - Test beam
- December - January
 - Test beam II