

# **Plan for irradiation testbeam in PSI**

(Goal & Preparation)

2020.06.15

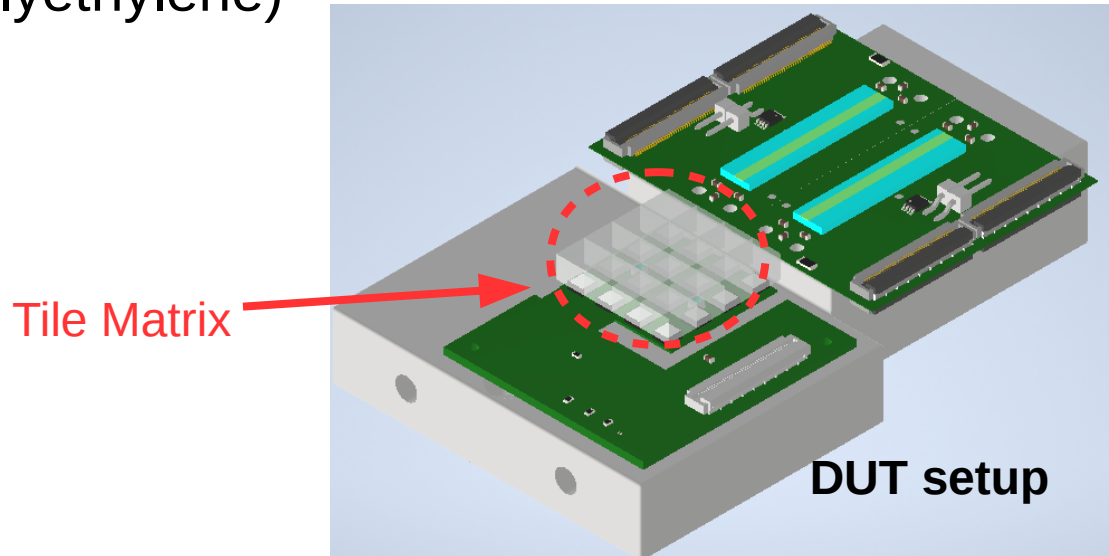
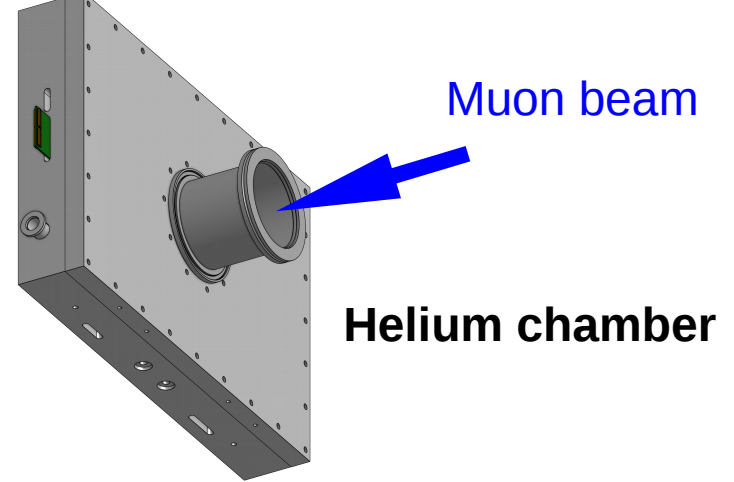
Tiancheng Zhong

# Motivation & Goals

- Previous study: timing resolution will be effected by irradiation damage
  - eg. MEG-II timing resolution deteriorates by  $\sim 29\%$  ( $30^\circ C, 7 \times 10^9 n_{eq}/cm^2$ )
- Check the irradiation hardness of Tile Matrix (SiPM + Tile)
  - whether the matrix fulfills the requirement for full phase I run  
 $5 \times 10^{10} n_{eq}/cm^2$

# Setup information

- Start from July 27<sup>th</sup> @piE5 (3 weeks)
- Helium chamber:
  - Helium gas
  - Target mounted inside (polyethylene)
- DUT: SiFi SiPM + Tile Matrix
  - Water cooled
  - With HV



# Plan for test

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- Ship Tile Matrix setup to PSI
- Irradiation (with HV) until reach Phase I dose
- Storage in low temperature
  - CMS lab in ETH until able to transport back to HD
  - Store in fridge in Heidelberg (**to confirm**)
- Further testbeam in DESY (maybe in October)
  - Transportation: box with dry ice

Dry ice box  
(borrow from PI)



# Preparation

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- Tile Matrix ✓
- Adapter boards: Already got and will be test this week ✓✓
- Cooling plate: reviewing with full setup ✓✓
- Dose estimation: in process (together with Lukas and Thomas)
- Transportation
  - Storage: CMS lab in ETH (confirmed with Lukas) ✓
  - Transportation: Box with dry ice ✓

# Backup slides

# Questions:

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What is the target? Size material, distance [polyethylene,]

What is the exact tetbeam time? From to **Done**

Any place to store the tile matrix for something like 2 month [yes, CMS lab, ETH]

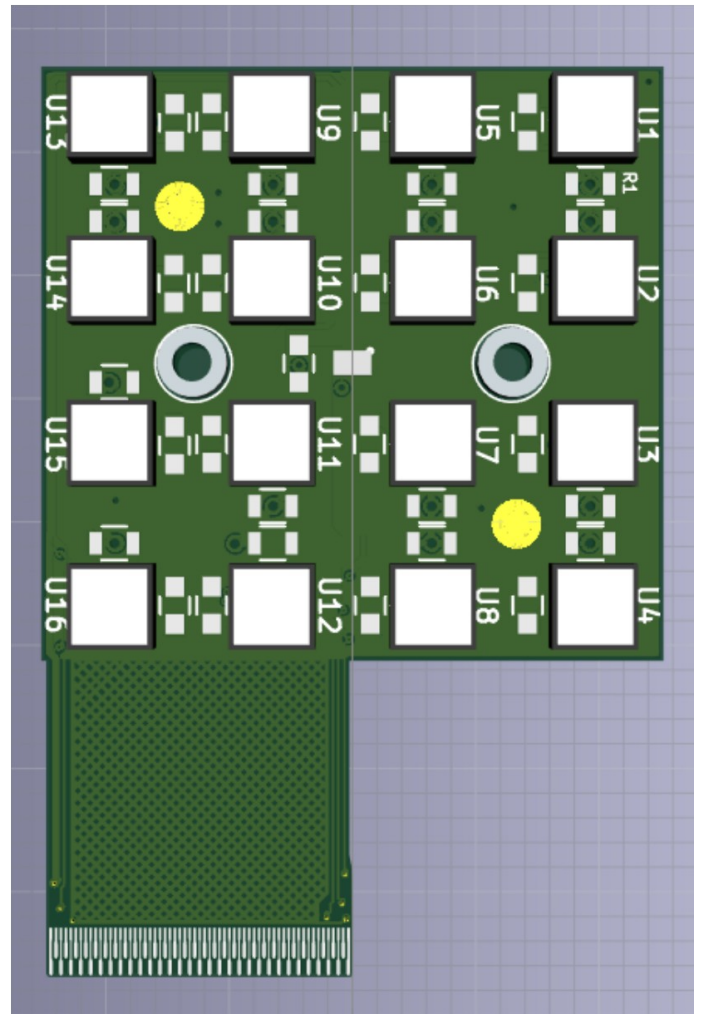
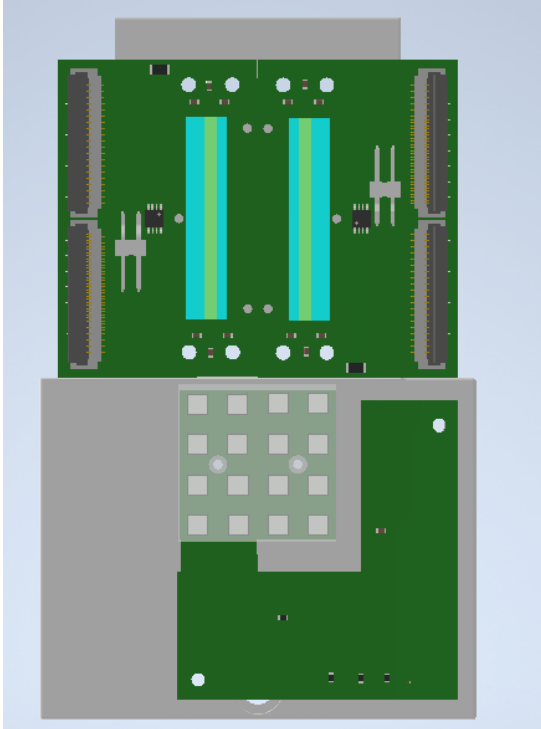
What is the best temperature to store? **TODO**

Low temperature annealing=> **TODO**

**Temperature test of dry ice box**

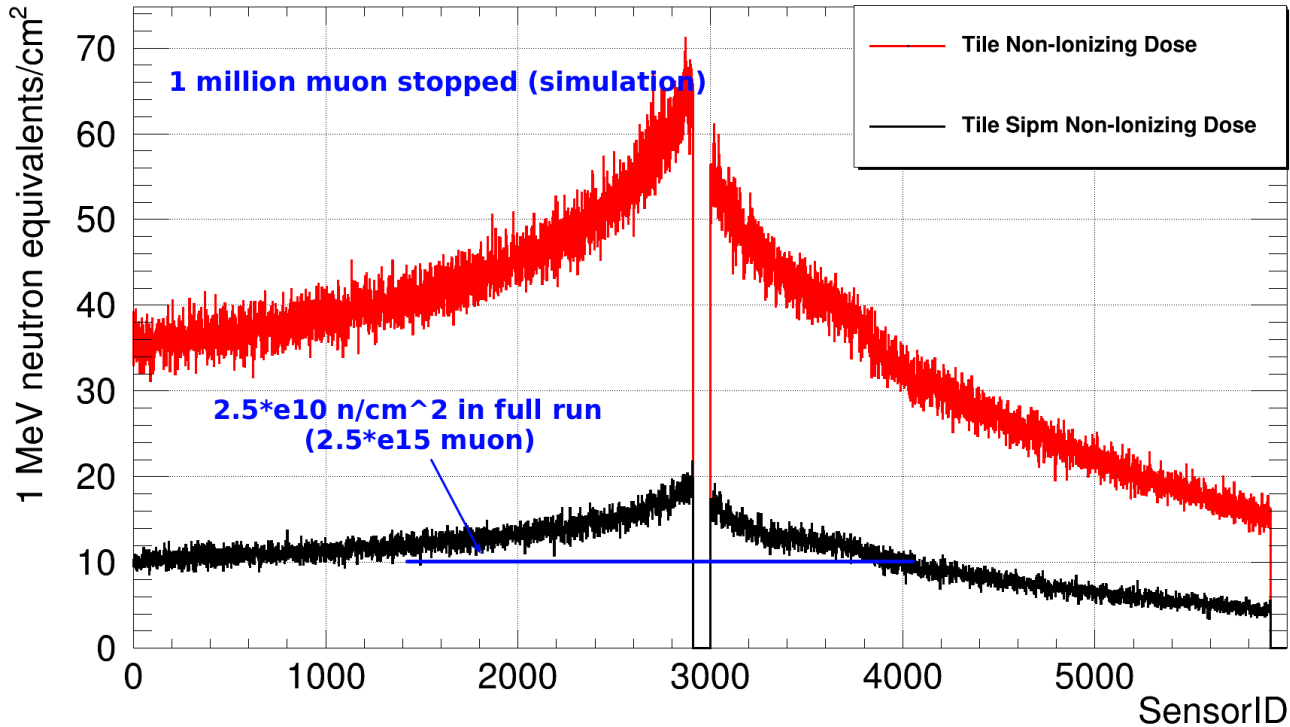
# BK slides

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# Simulation for mu3e tile



# Simulation position vs dose

