

A new cylindrical photon-veto detector for the KOTO experiment

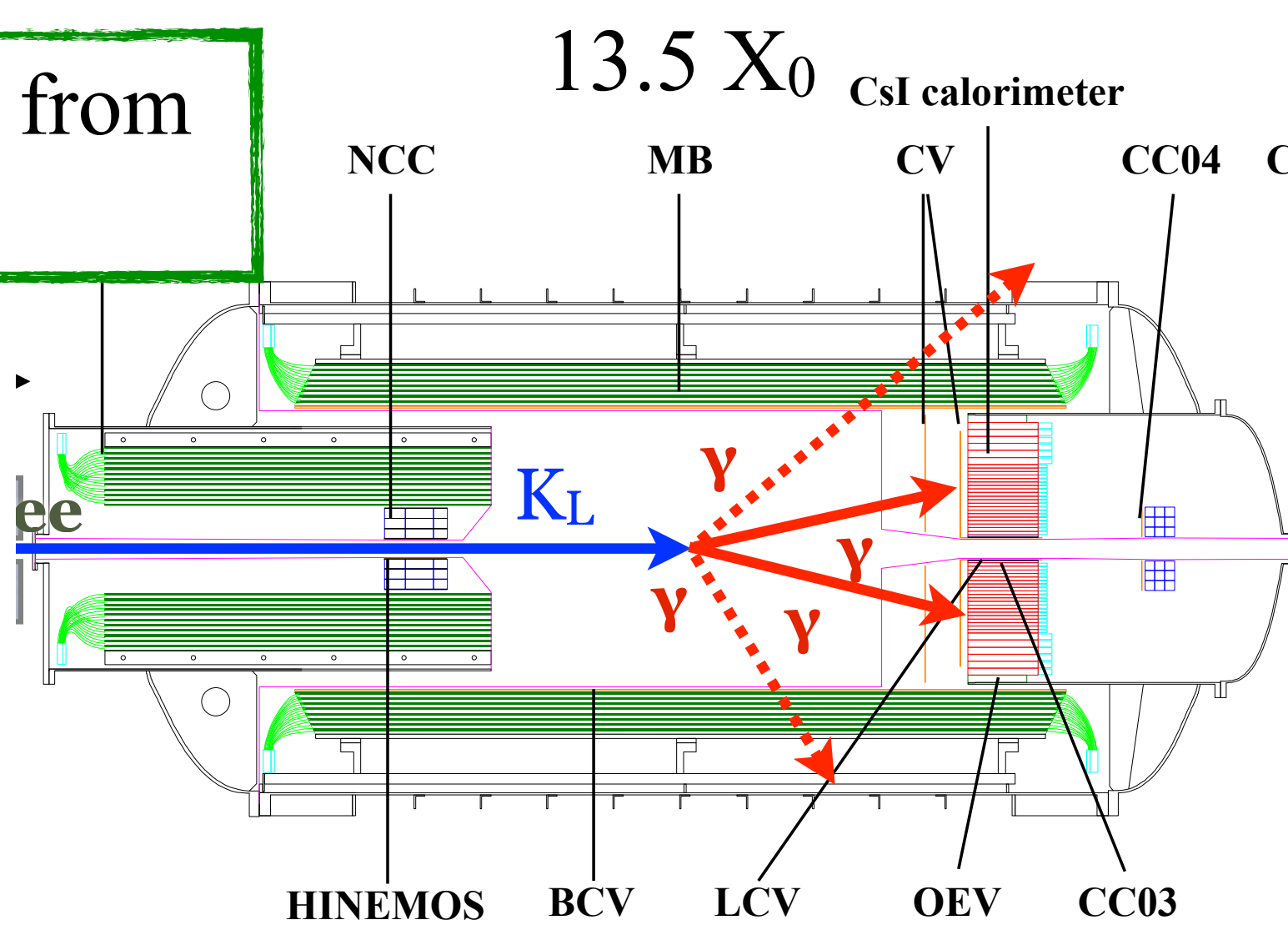


Osaka University Manabu Togawa
for the KOTO collaboration

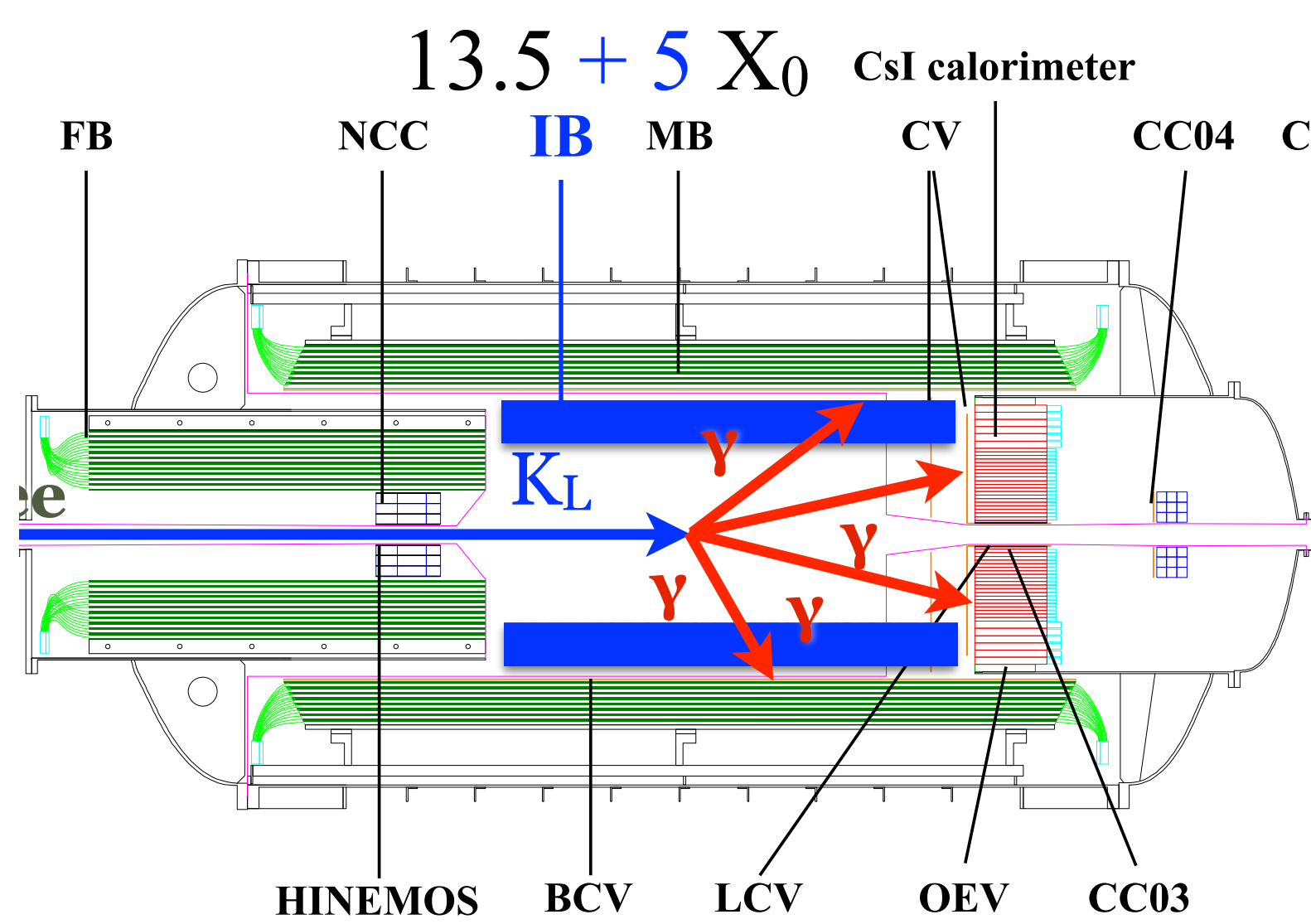


- We installed a new photon-veto detector (Inner Barrel) in April 2016.
- Suppress $K_L \rightarrow 2\pi^0$ background to be 1/3
- First physics run with the Inner Barrel at May-June.

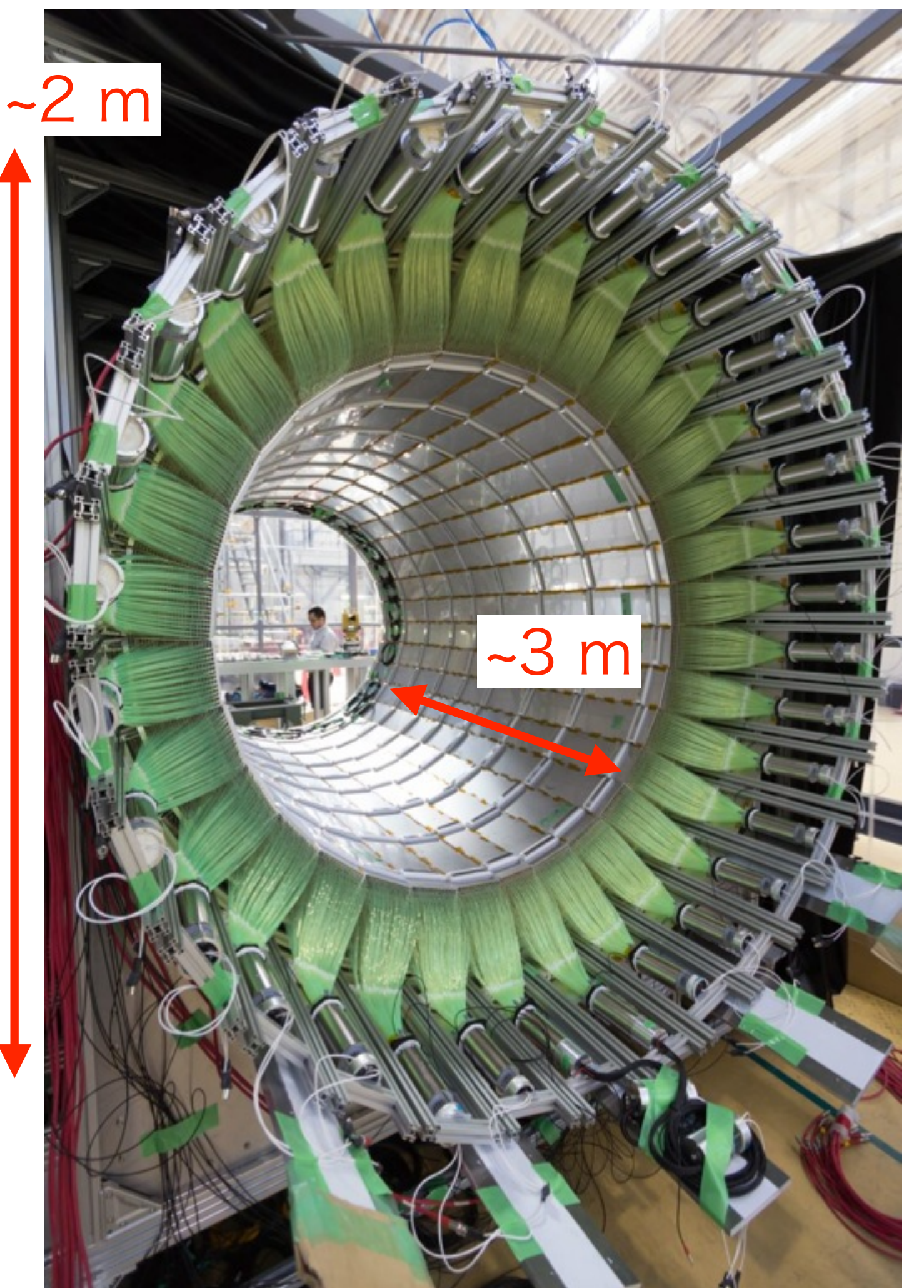
Background from
 $K_L \rightarrow 2\pi^0$



Looks $K_L \rightarrow \pi^0 \nu \nu$ event... :(

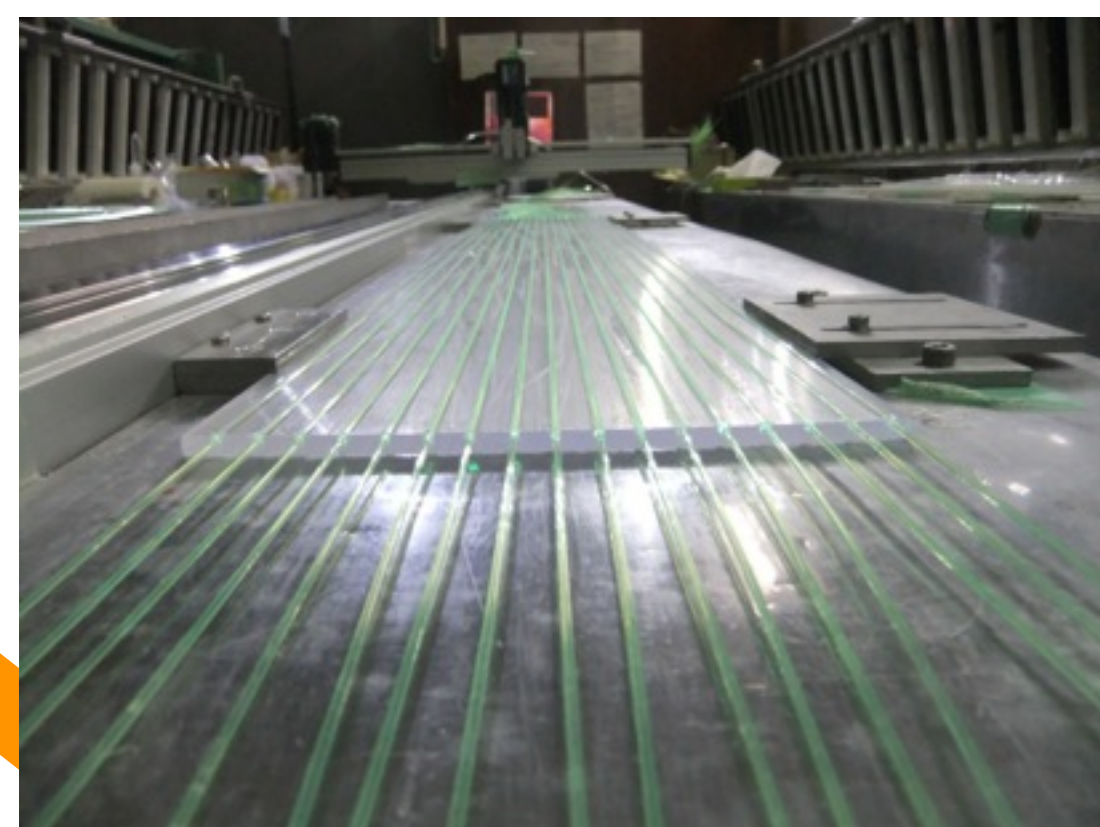


Remove by increasing efficiency :)



Trapezoidal shape x 32

~2013



- Sandwich Calorimeter
5 mm-thick scinti. (MS resin) x 25
1 mm-thick lead plate x 24
Read out by WLS fiber (BCF92) $\tau \sim 2.7$ ns

Fixed specification.

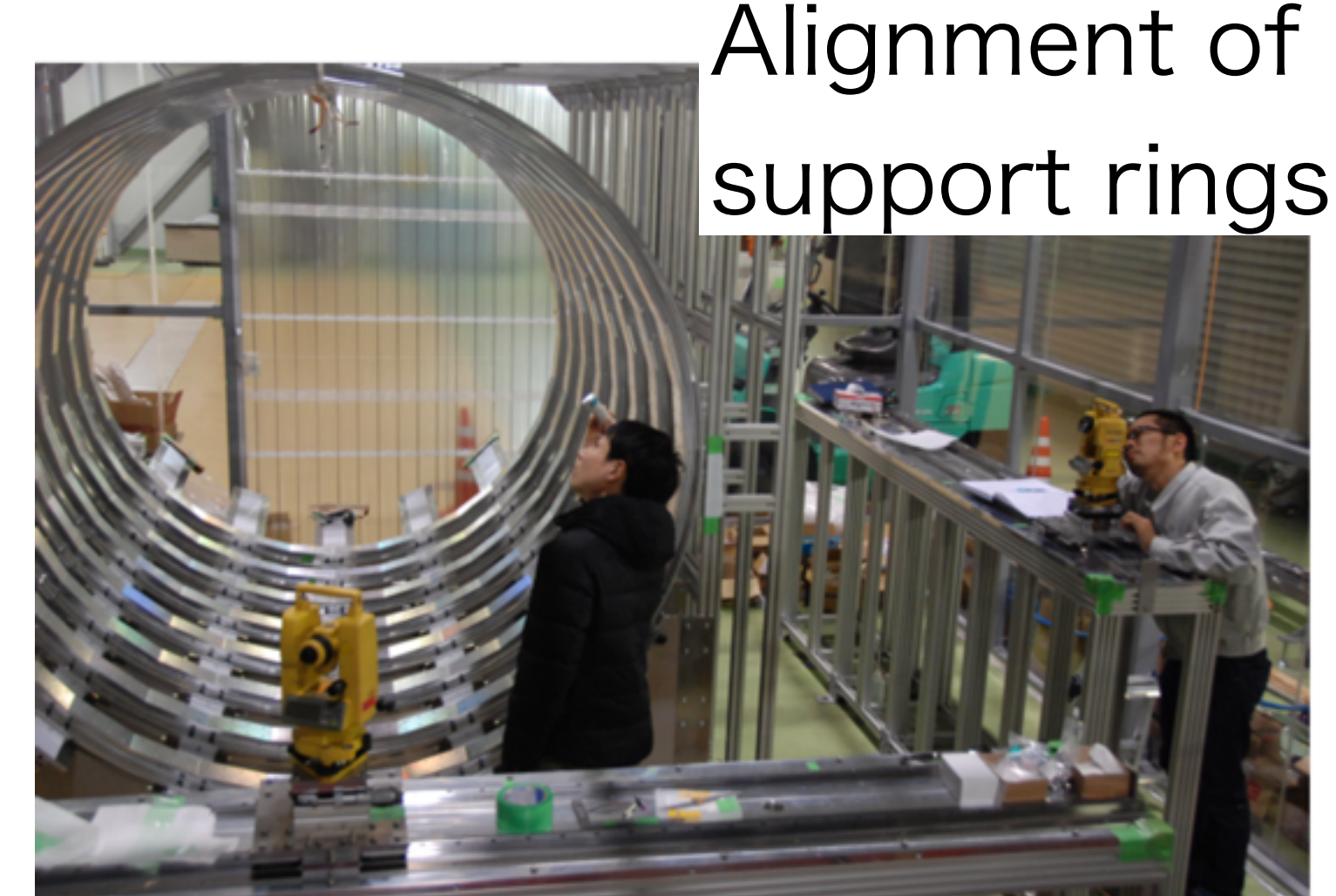
Fiber attachment
with company



2014



Module construction



Alignment of
support rings

Crack appears !!



Due to uncured glue.
Re-cure, re-production...

2015

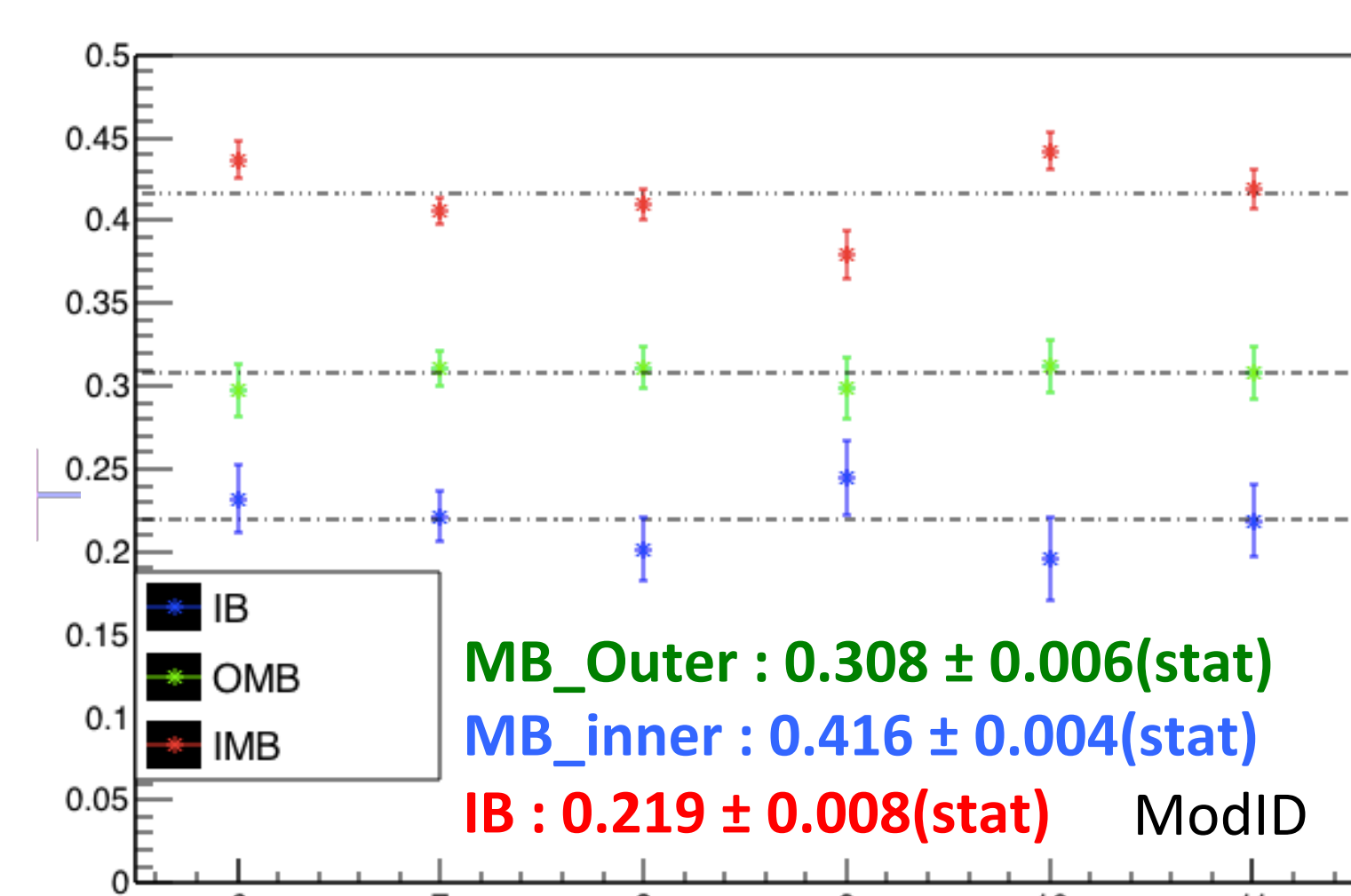


Installation of modules

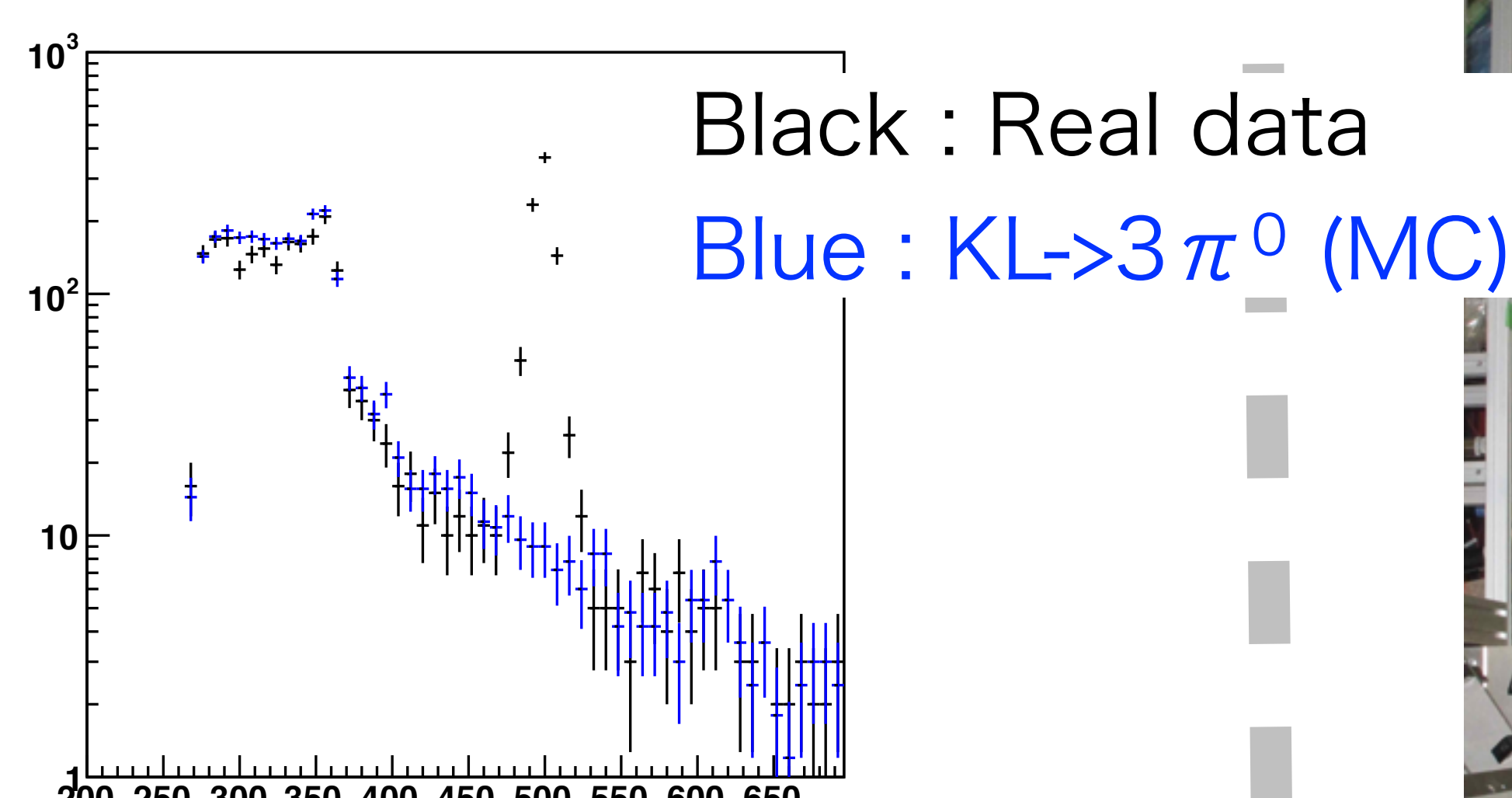
2016 physics run (May - June)

Timing resolution evaluated
by cosmic-ray

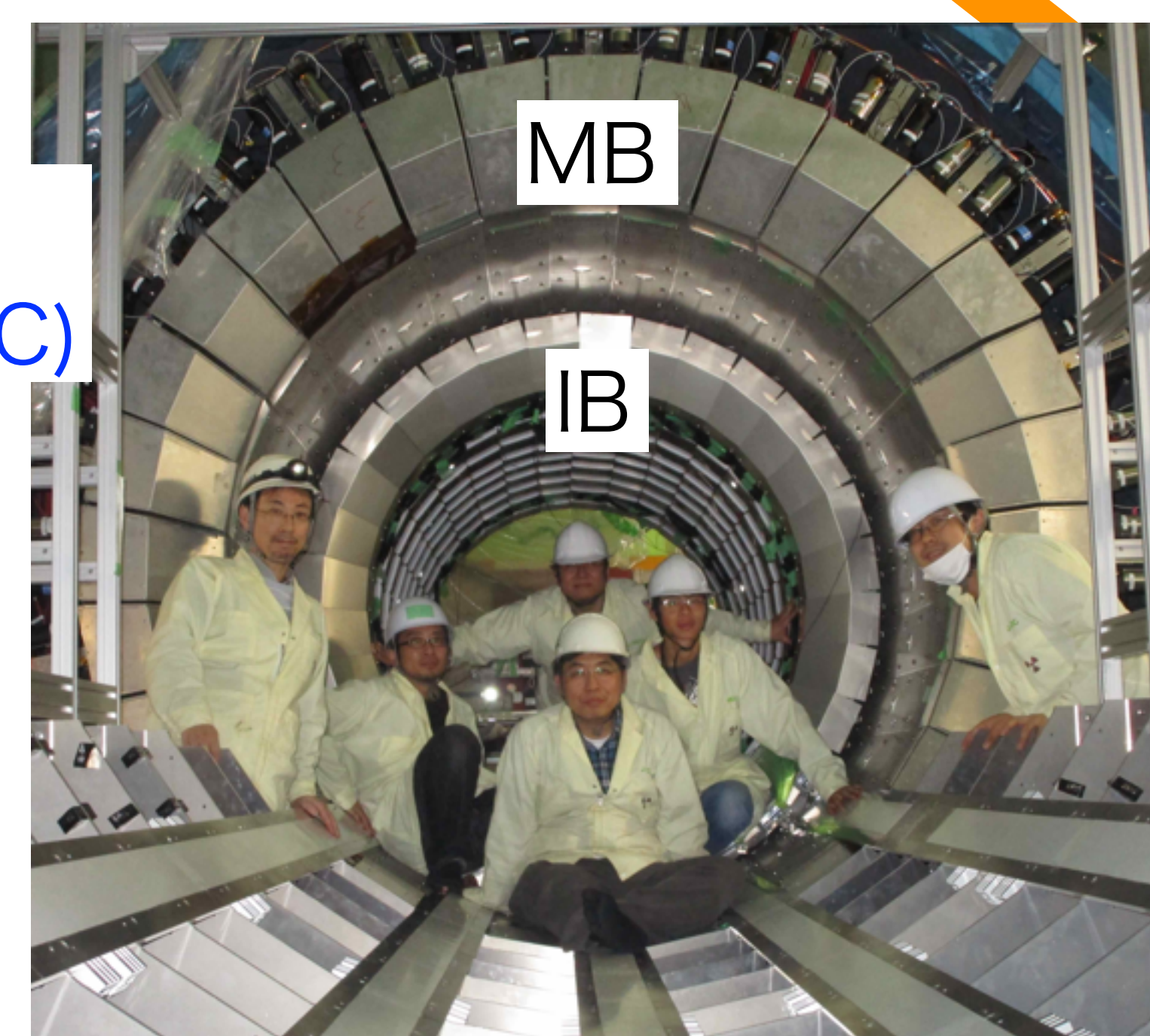
$K_L \rightarrow 2\pi^0$ reconstruction by
4 γ event w/ MB&IB veto cut



Timing resolution (ns)



M_{K_L} (MeV)



2016

Installed !!