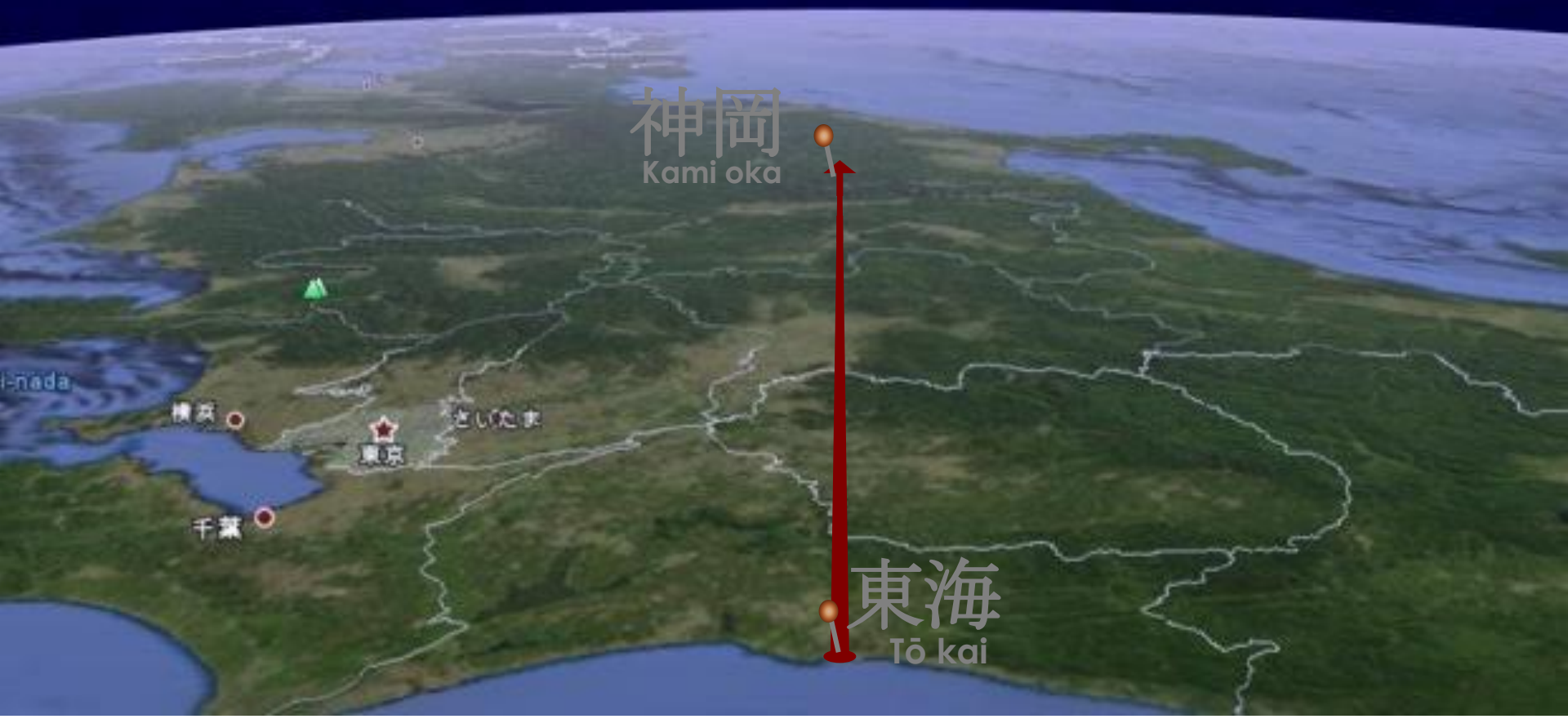




# T2K, T2K-II and HyperK



神岡  
Kamioka

東海  
Tōkai

# Summary of (approximate) requests for T2K/NA61



## common funds

T2K (2 or 3 institutes -ETHZ?) 40kCHF per year  
NA61 (Bern,UNIGE, ETHZ) 33 kCHF per year

Upkeep of detectors 40 kCHF per year

ToF and trigger, DAQ for NA61

TPC for T2K

total → 100 to 120 kCHF per year for participation, upkeep

**Baby-MIND** measurement of H<sub>2</sub>O/Scintillator cross-section with large angle and fine grain detector to be used in T2K (meast 2018-2020)

All scintillator photosensors (4000ch)

completion of electronics and DAQ 120 kCHF

mechanical supports @ CERN 20kCHF

packaging and shipping 60kCHF

mechanical supports @ JPARC 80kCHF

total *prelim estimate* 280kCHF

contingency 30kCHF

total Baby MIND: 310kCHF

**GRAND TOTAL (preliminary) for 2017-2018**

**550kCHF**

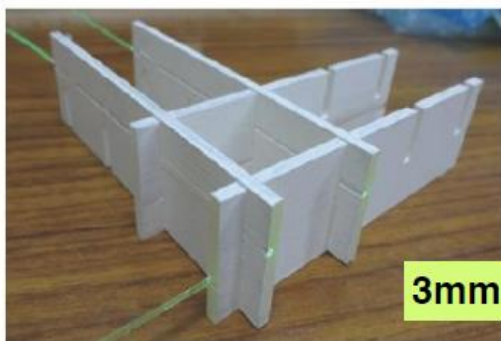
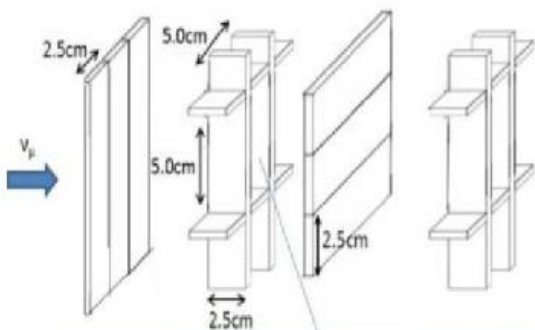
3% precision  $H_2O / CH$  x-section ratio

# Wagasci

Wagasci collaboration

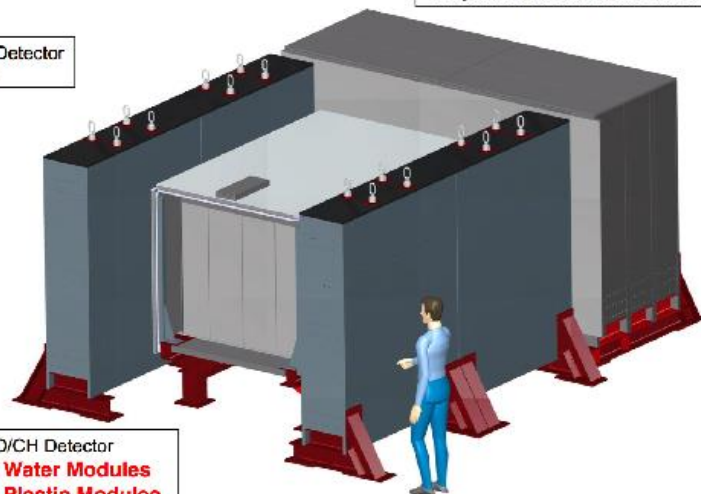
## 'The B2 experiment'

- 3D scintillator grid filled with water
- Side MRDs and end MRD (magnetized)
- Excellent phase space coverage



3mm thick

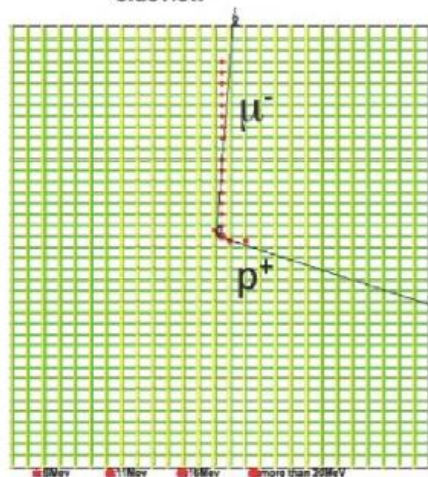
Side MRD Detector  
- 4 Modules



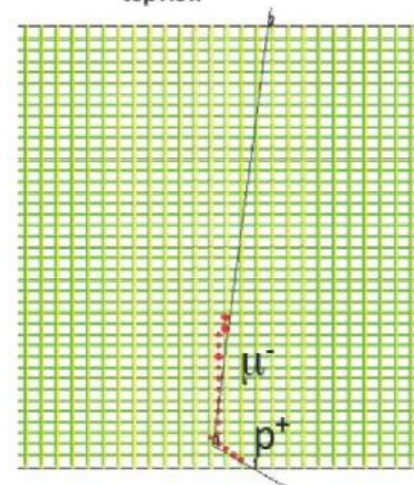
Downstream MRD Detector  
- Magnetized Steel / Scintillator Detector

$H_2O/CH$  Detector  
- 2 Water Modules  
- 2 Plastic Modules  
- 5120 Channels

sideview

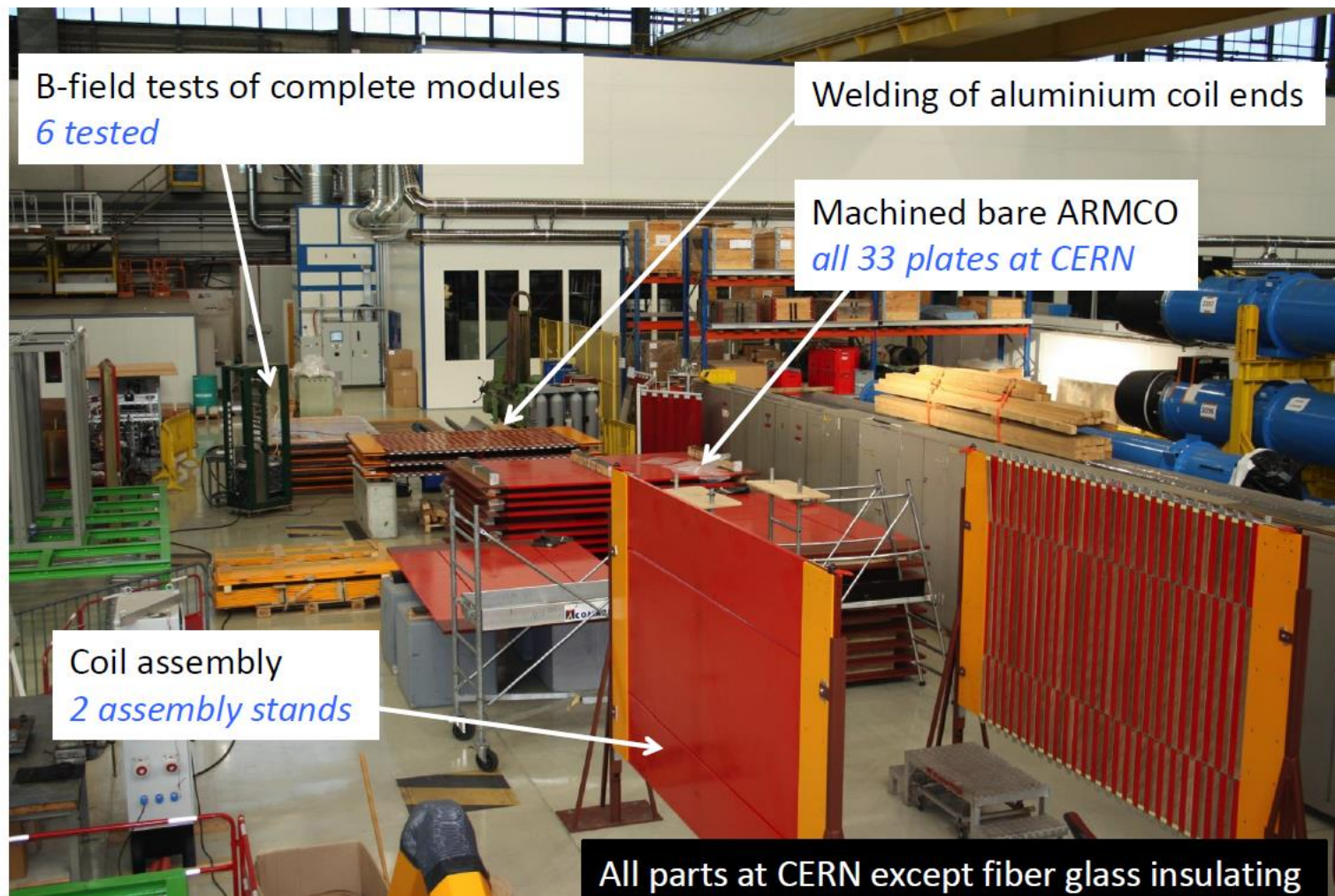


topview



See talk on Tuesday

# Magnet production



B-field tests of complete modules  
*6 tested*

Welding of aluminium coil ends

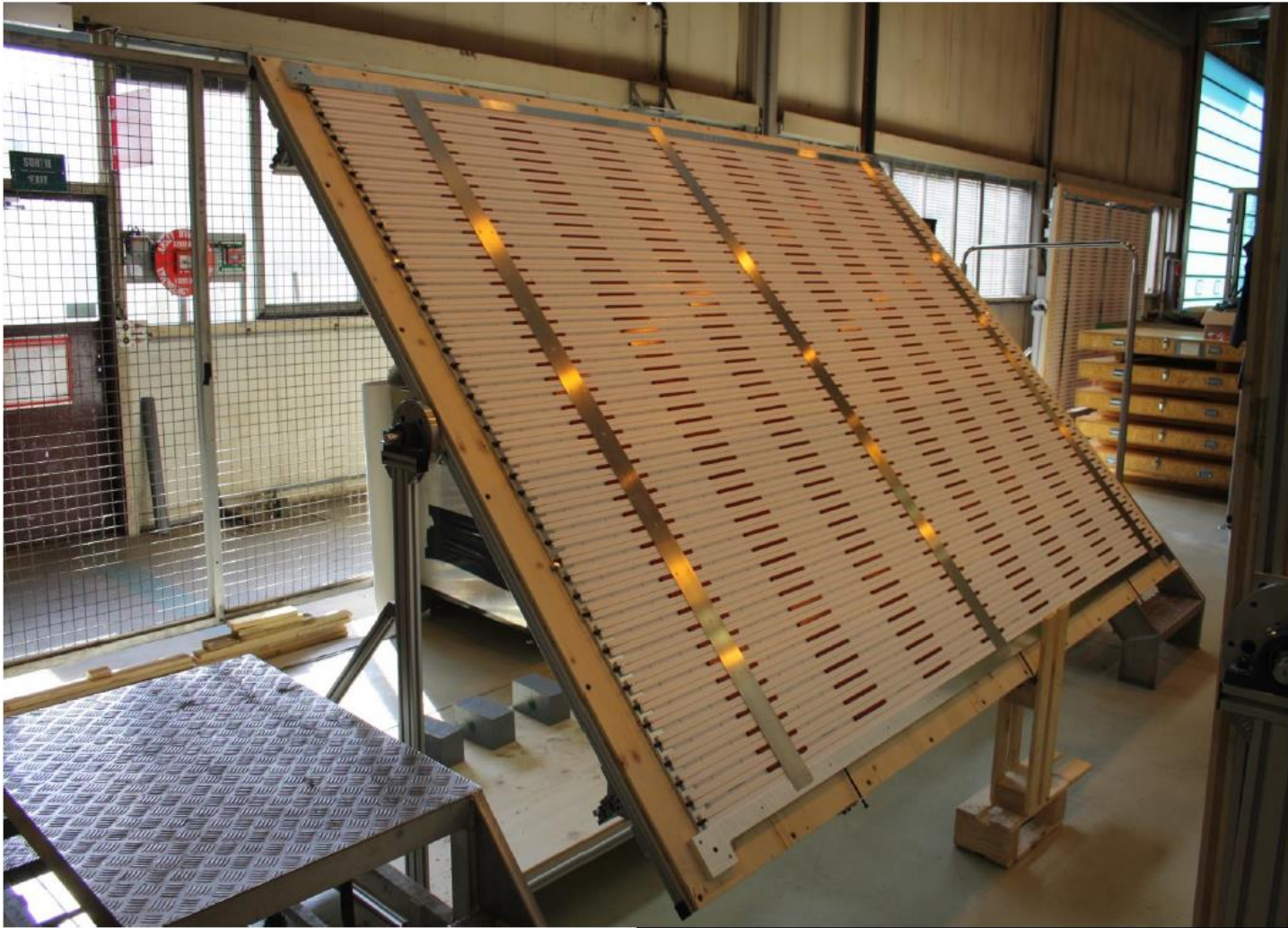
Machined bare ARMCO  
*all 33 plates at CERN*

Coil assembly  
*2 assembly stands*

All parts at CERN except fiber glass insulating sheath (delivery end November for extra)  
*... enough for 6 modules*

2 magnet modules every 7 days  
10 done, 23 to go: 20 done by end 2016

# Scintillator module production

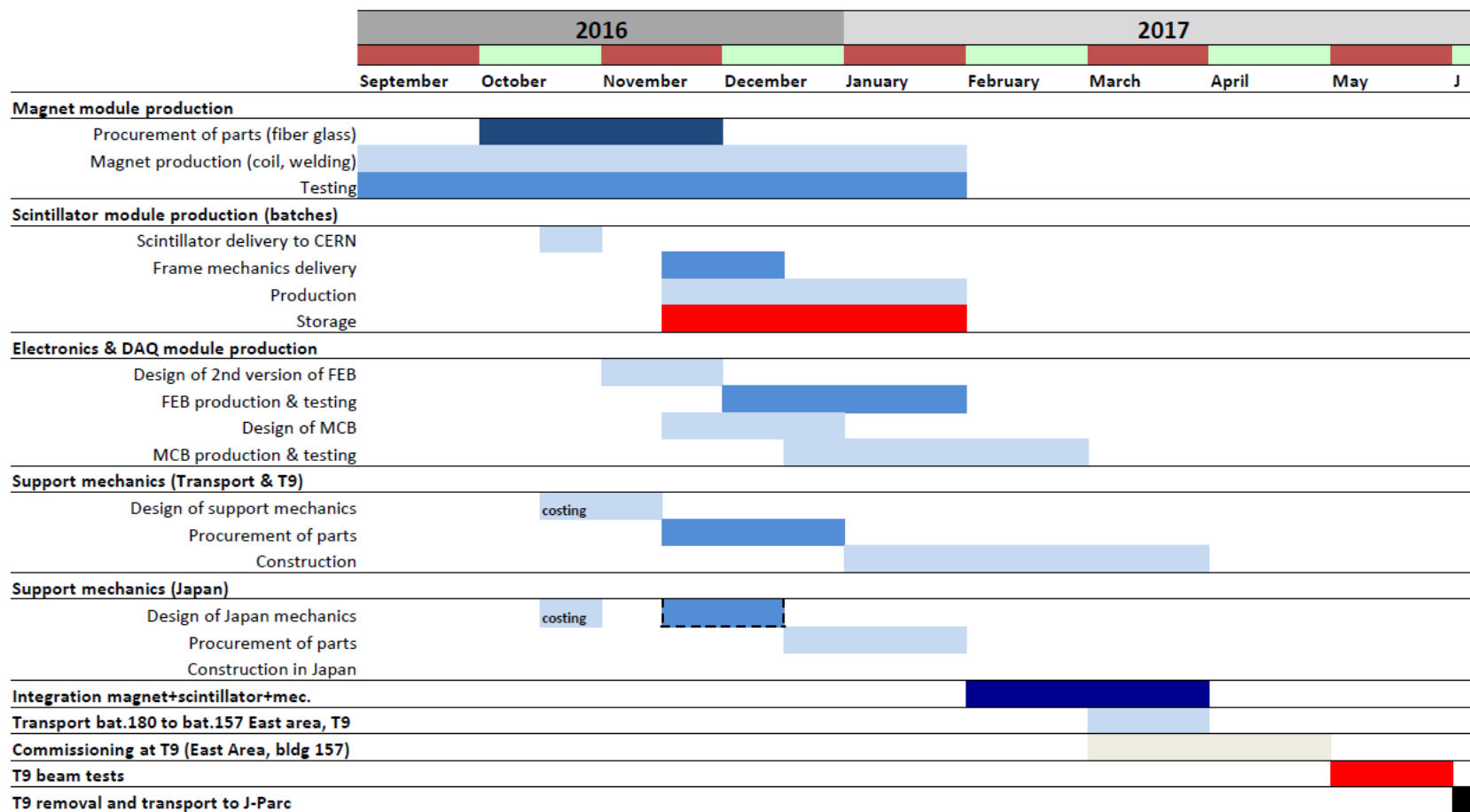


2 to 3 modules every 5 days  
1 done, 18 to go: 10 done by end 2016

Scintillator from Moscow: end October  
Support mechanics from CH: ??

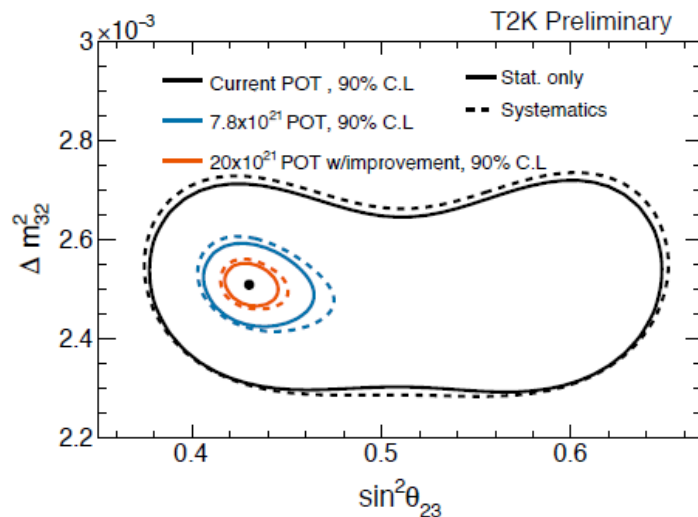
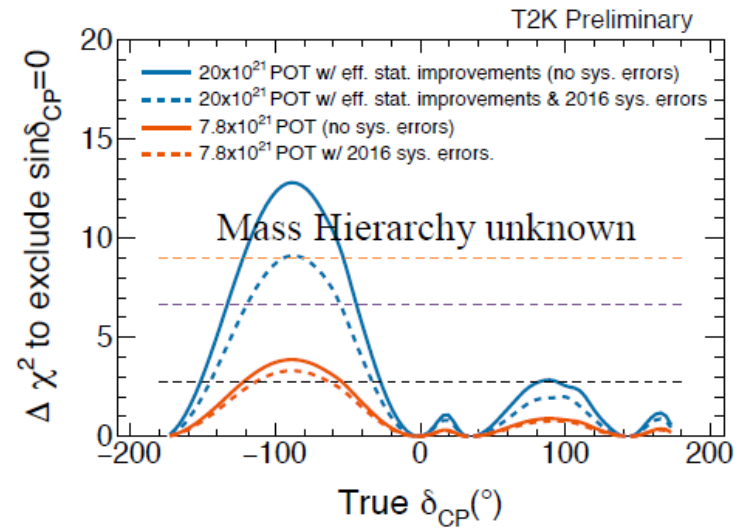
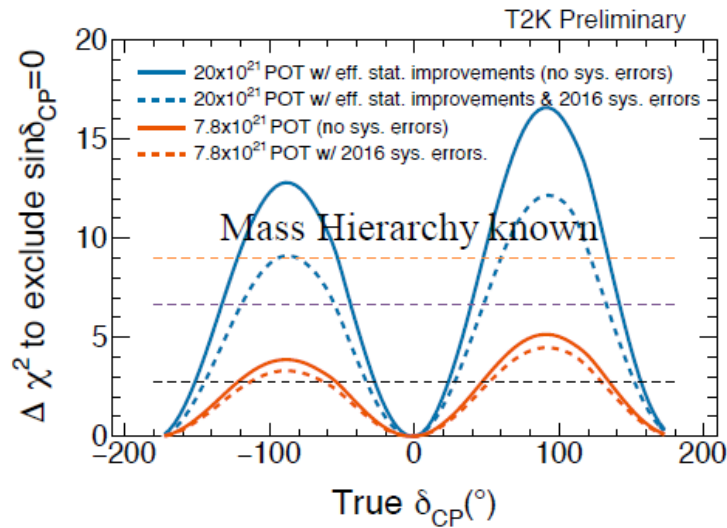


# Schedule



Stage-I approved by JPARC PAC  
needs convincing reduction of syst!

# Physics Potential of T2K-II

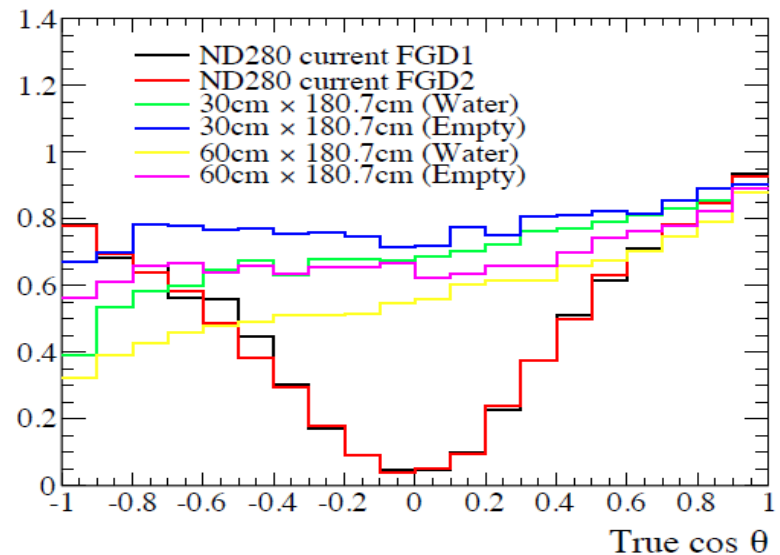
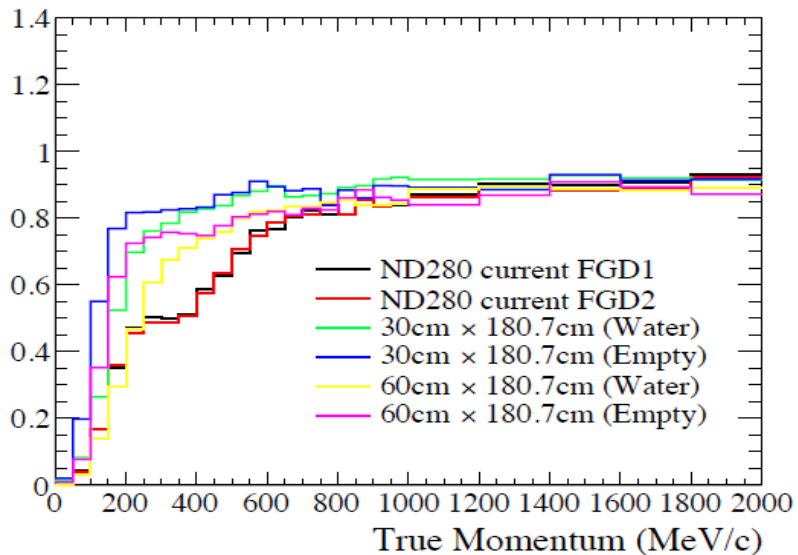
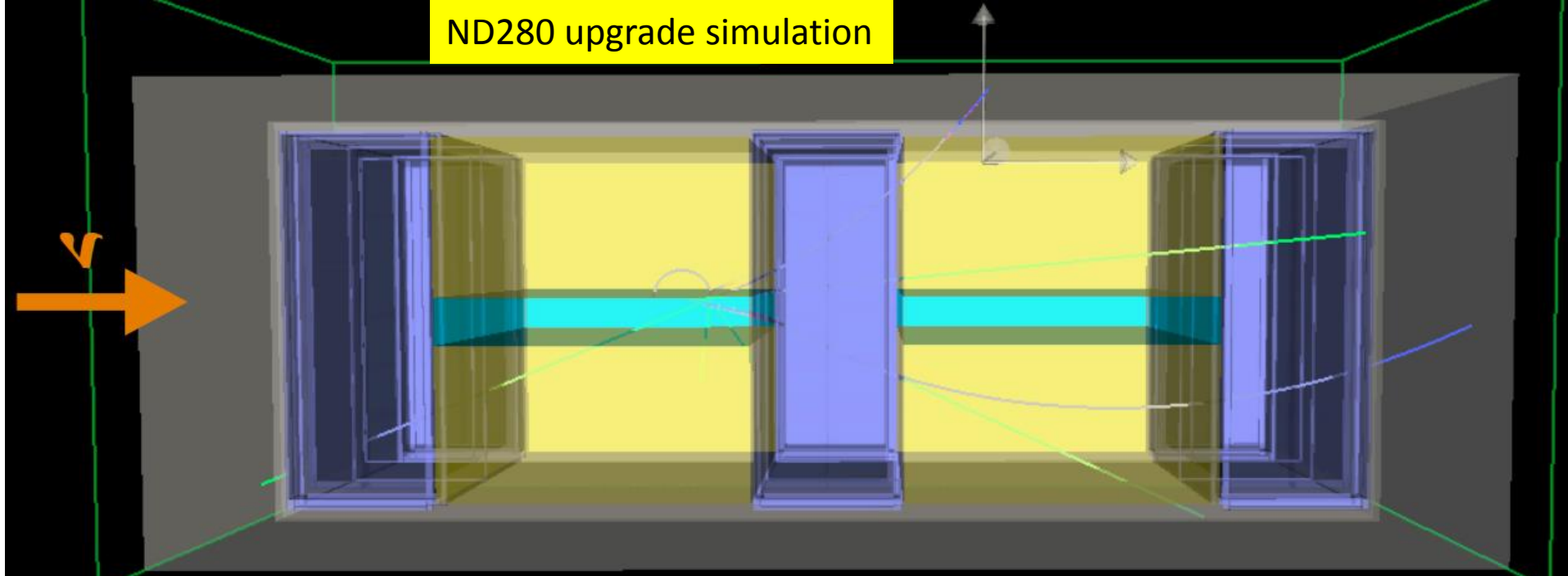


- ~50% increase in effective POT
- ~3 $\sigma$  sensitivity to  $\delta_{cp}$
- Precise measurement of  $\theta_{23}$ 
  - resolution of 1.7%

arXiv:1609.04111v1 [hep-ex] 14 Sep 2016



# ND280 upgrade simulation



- Thickness 60cm provides x2 mass but lower efficiency
- New detector configuration provide a much better acceptance at high angles

## For 2019-2020

There will still be the common funds and upkeep. → O(240)kCHF

If my successor is interested in T2K-II (especially if HyperK is approved 2d half 2017) a construction project towards the Near Detector upgrade is a possibility.

Contribution to construction of TPC for near detector has been assumed (800kCHF)

It is too soon to be more specific, the work is only starting.

