

Status and Plans

Davide Sgalaberna

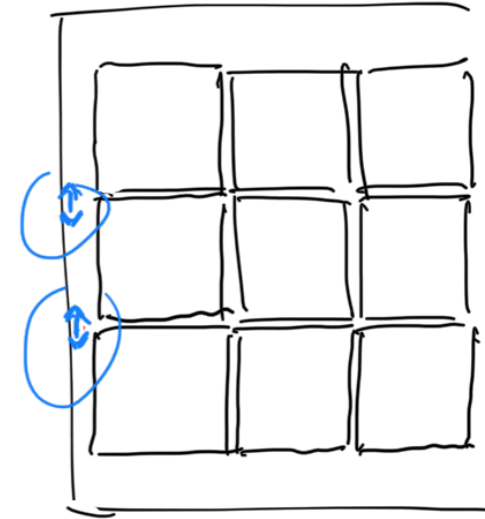
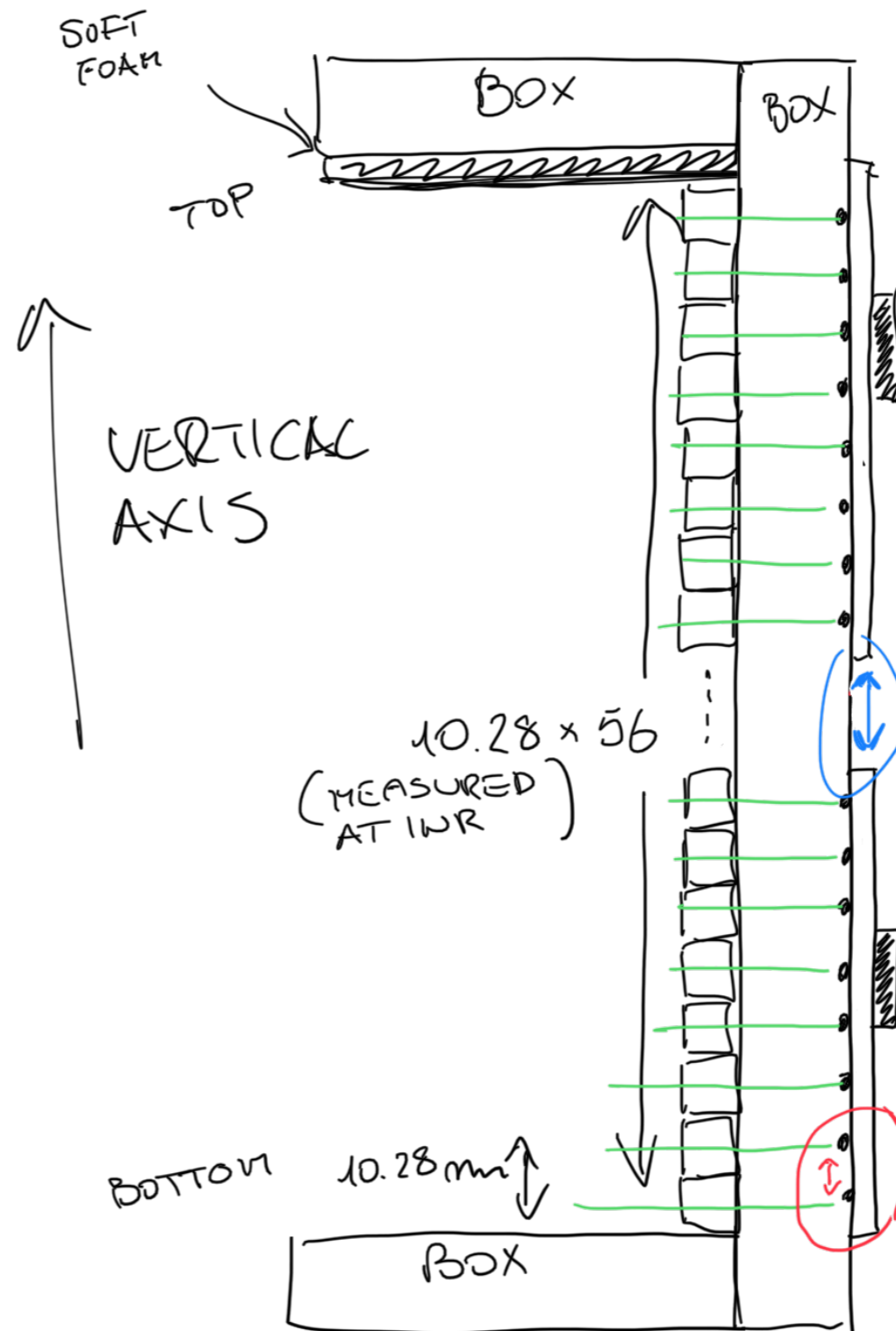
SuperFGD mechanics meeting

7/12/20

Proposal for hole pitch

Last week we had a meeting to take decisions about vertical pitch and consequences. The proposal is:

- 1) Height of the box will be consistent with a cube pitch of 10.28 mm (not 10.29 mm as previously proposed). Hence, it will be consistent with the measurement performed at INR. The reason is that tuning the box on the cube pitch of 10.29 mm gives a max cube-box hole misalignment of ~1.1 mm by default, while we may also have fluctuations on the opposite direction.



PITCH BETWEEN
HPPC-PCB, TO BE
TUNE TO ABSORB THE
LOCAL MISALIGNMENT
DF :
 $(10.30 - 10.28) \times 8$
mm

LOCAL PITCH
10.30 mm

Proposal for hole pitch

2) a different height of the cube stack may not fit the box height. It will have to be absorbed by the soft foam at the top.

3) The conical hole will have 4mm max diameter and 3mm min diameter with a length of 4mm (as it is now in the model).

- the hole pitch with the 8x8 pocket will be kept to 10.30 mm, so that the fiber-mppc alignment will be provided even after a 90 degrees rotation of the MPPC-PCB. A variable different pitch, ($10.28 \text{ mm} * 8 = 82.24 \text{ mm}$), between the different pockets in the vertical direction only (hence MPPC-PCBs) will be implemented.

4) conical holes will be made only for the box side plates. It was commented that for conical holes are not necessary for the assembly. We don't expect particular alignment issues on the bottom plate (first layer to be put into the box) and top plate.

See later Larry's talk for more (and more precise) updates

SuperFGD envelope

At the Technical Board meeting on the 27th of November it was decided to take 2 cubes (i.e. vertical layers perpendicular to neutrino beam direction) out of SuperFGD for envelope issues

- Aim not to change the MPPC-PCB design but don't use 1 row of MPPCs (e.g. remove them)
- Possible to remove 1 cube upstream
- Maybe some modifications to the box design are required for removing the 2nd cube on downstream side

Dave Warner (engineer who worked on the P0D mechanics) found the original P0D CAD model

- He will upload it to EDMS. Not done yet
- Allow to double check the detector envelopes

To be done:

- Add P0D model to the basket, check envelopes and clearances
- Check sFGD if 2 cubes can be removed from sFGD without issues
- Update box model after removing 2 cubes

Remaining tasks

- Remaining items before delivering the final design
 - ✦ Assembly parts (screws) —> Done
 - ✦ Brackets (design and FEA) —> Done
 - ✦ Hole pitch, conical holes —> update in progress (see talk Larry today)
 - ✦ Integration of LED calibration system —> to be updated with pitch
 - ✦ Integration of MPPC-PCB (pitch, alignment holes, size) —> to be updated with pitch
 - ✦ Overall tolerance study —> it will be done with the 2D drawings
 - ✦ Update readout interface (pocket depth, alignment pin holes, etc.) —> to be completed
 - ✦ Thermal analysis (transports, summer/winter) —> to be done (1 week full-time work needed)
 - ✦ sFGD Envelope —> to be done (add POD model, check if 1 or 2 cubes can be removed)
 - ✦ FEA —> update in progress (see talk Adamo today)
 - ✦ Integration of cables and FEE —> not completed, not affecting mechanics but only envelope, Not in review but present the concept
 - ✦ Prototyping —> Big prototype being produced
 - ✦ Light barrier —> Not in review but present concept
 - ✦ Bracket basket-side design —> Not in review present concept

Complete tasks
2D drawings
Prepare documentation
Review



Today



December 2020



Month



To NP we send the model and FEA before removing the cubes
When the box design can be updated with removal of 2 cubes ?

Complete tasks

2D drawings

Prepare documentation

Review



Month



Today



January 2021

SUN
27

MON
28

TUE
29

WED
30

THU
31

FRI
Jan 1

SAT
2

XMas Holidays

3

4

5

6

7

8

9



*MPPC-PCB
production
to be started*

11

12

13

14

15

16



18

19

20

21

22

23



24

25

26

27

28

29

30

31

Feb 1

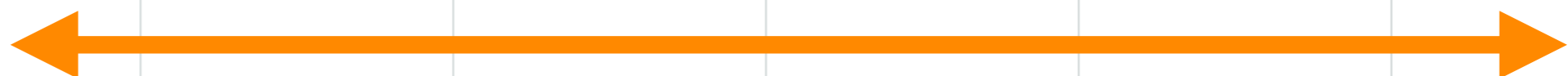
2

3

4

5

6



The 2D drawings are for review, not for production