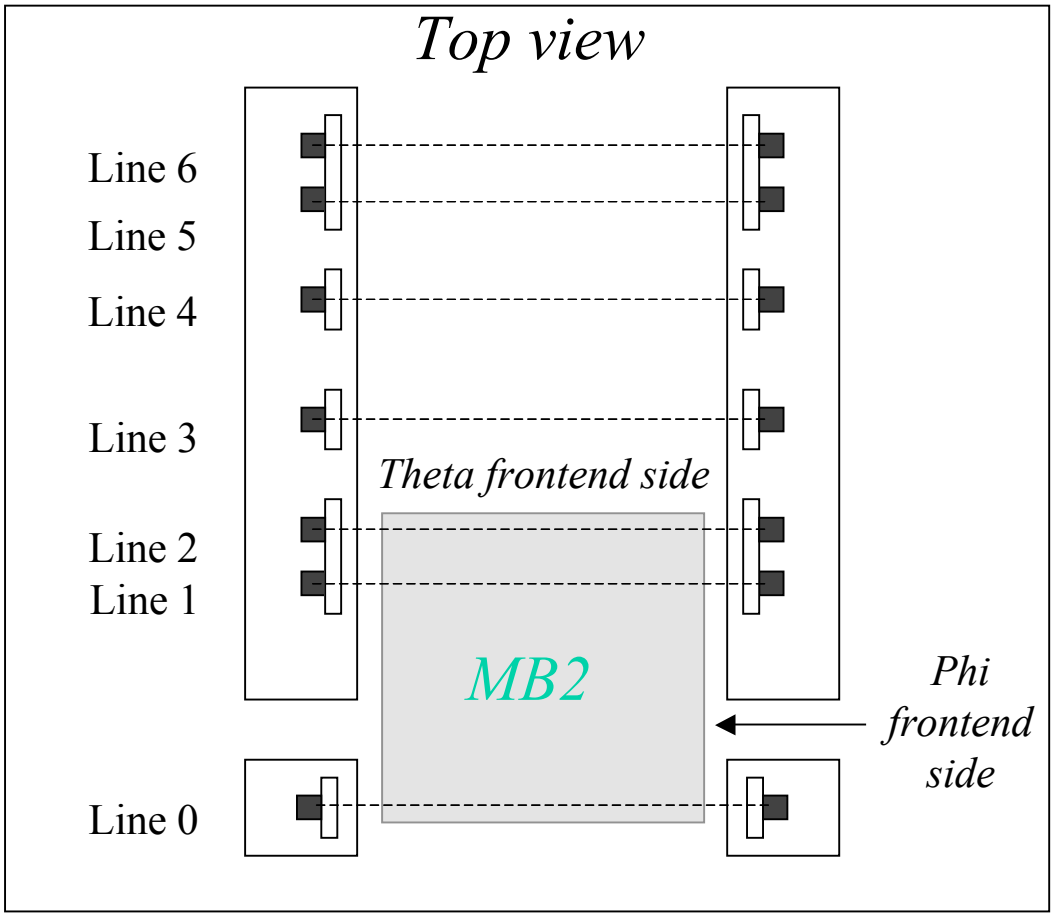
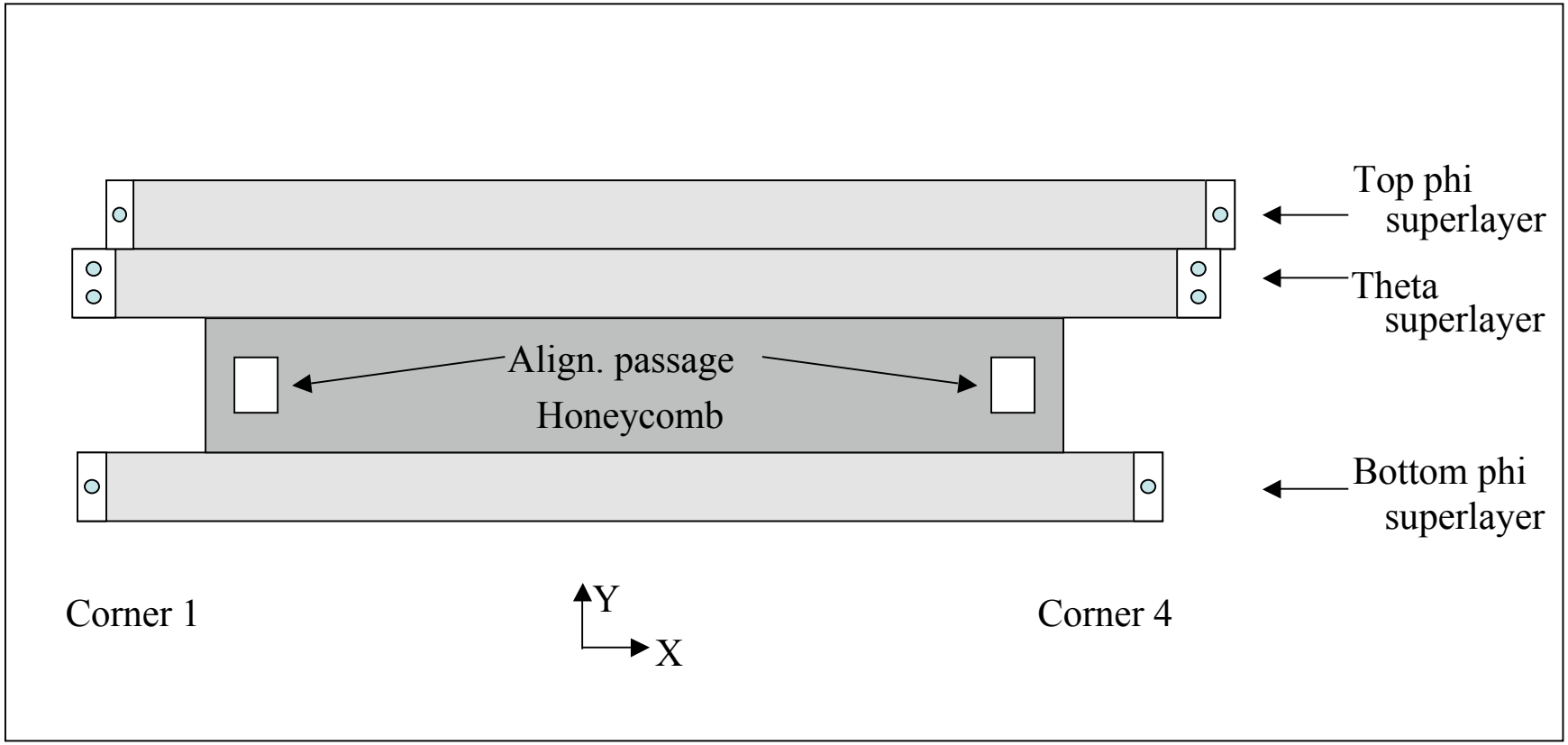
About the chamber calibration and geometry reconstruction

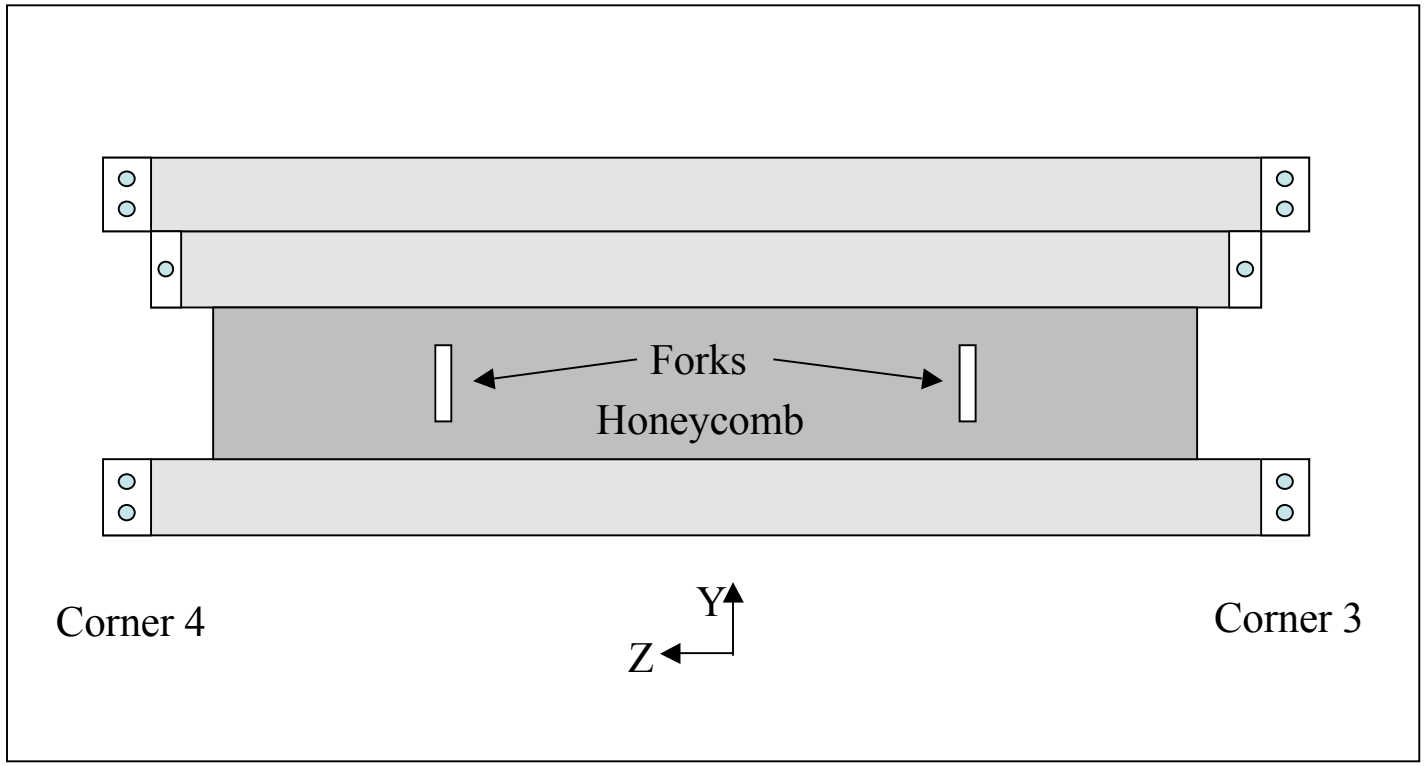
- Some explanation
- One example
- Where we are
- What can be expected



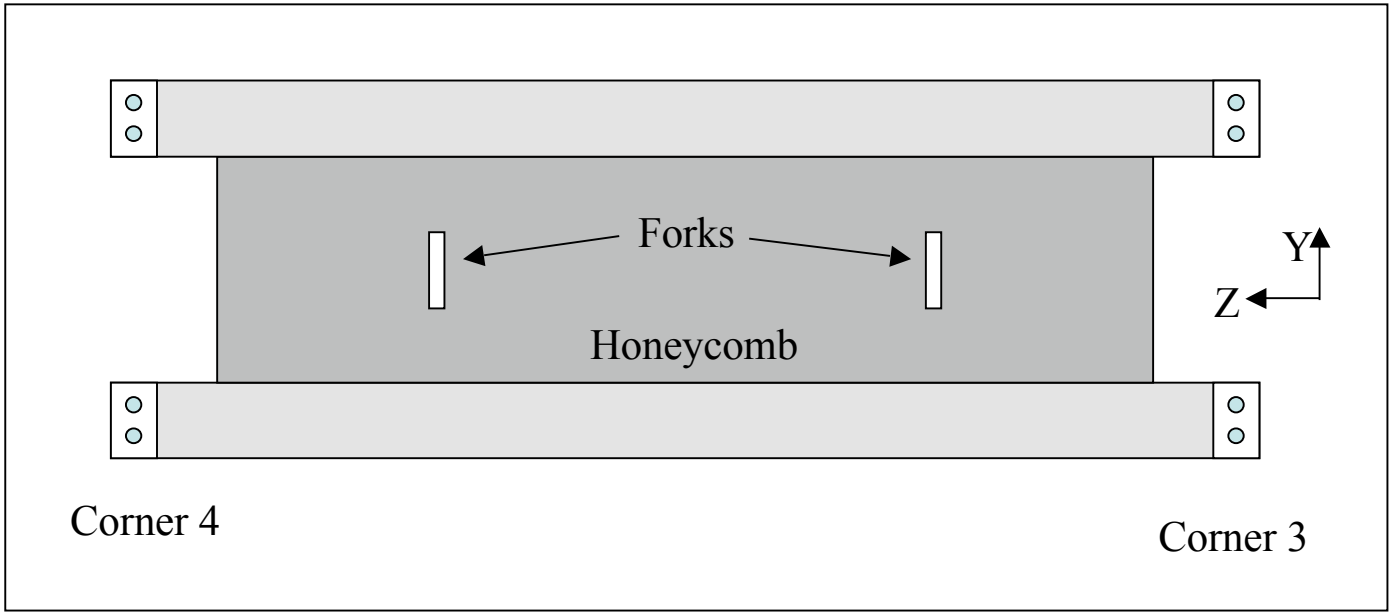
Schematic view of the calibration bench
with the calibration lines.



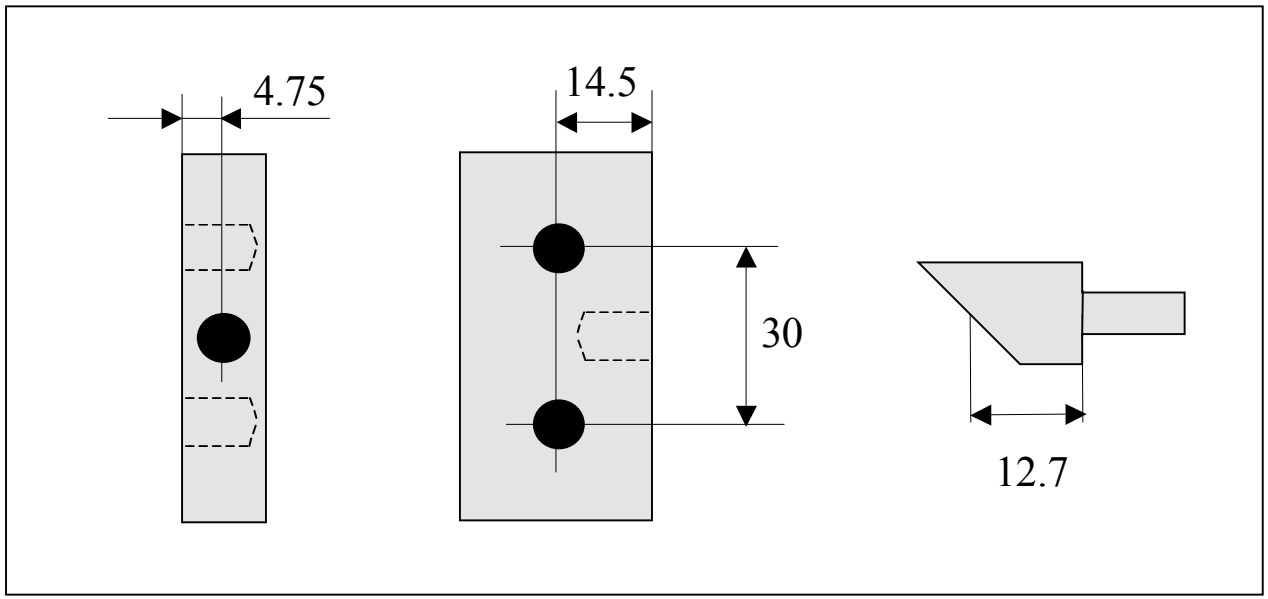
Schematic view of the MB1,2,3 chambers.
View from the phi front-end side.



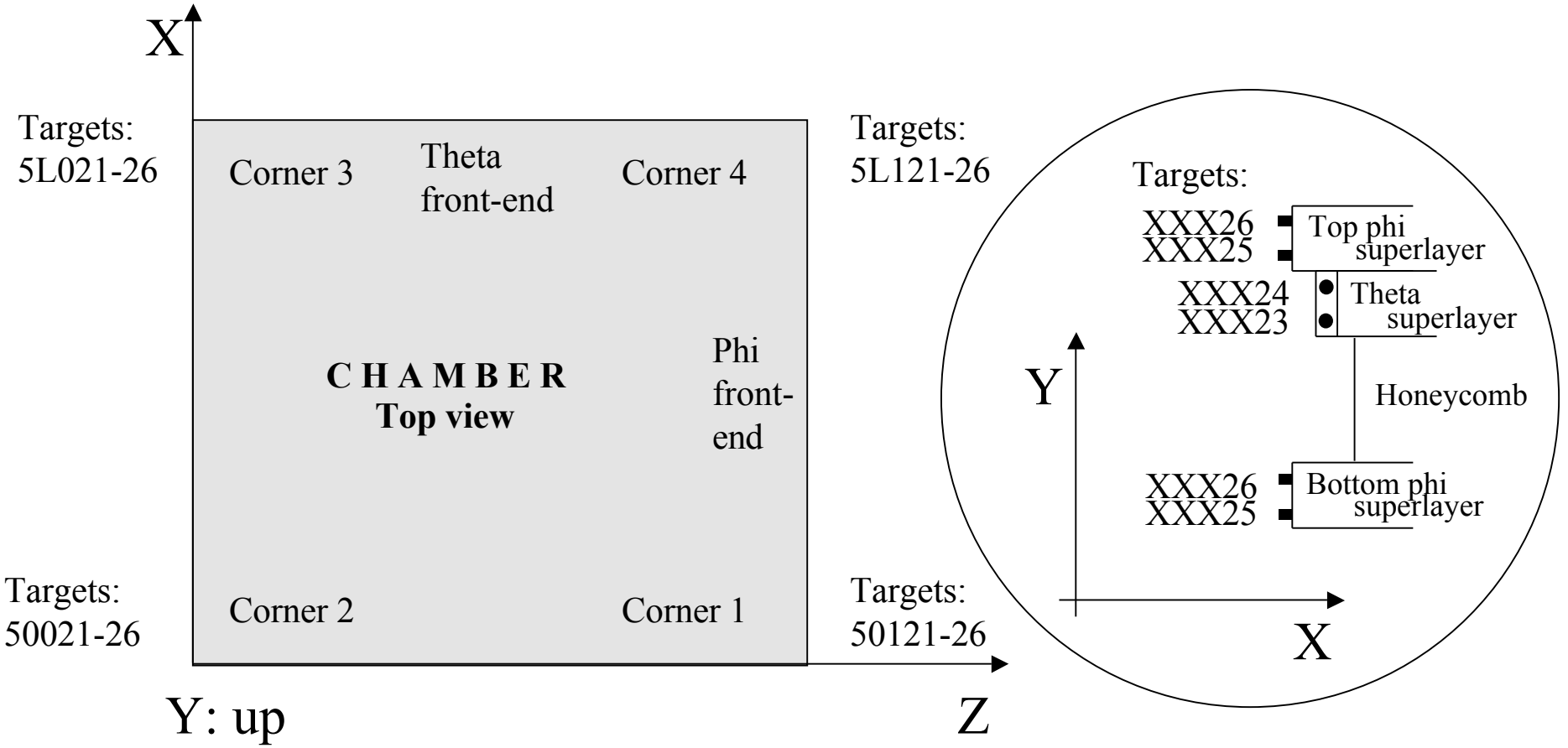
Schematic view of the MB1,2,3 chambers.
View from the theta front-end side.



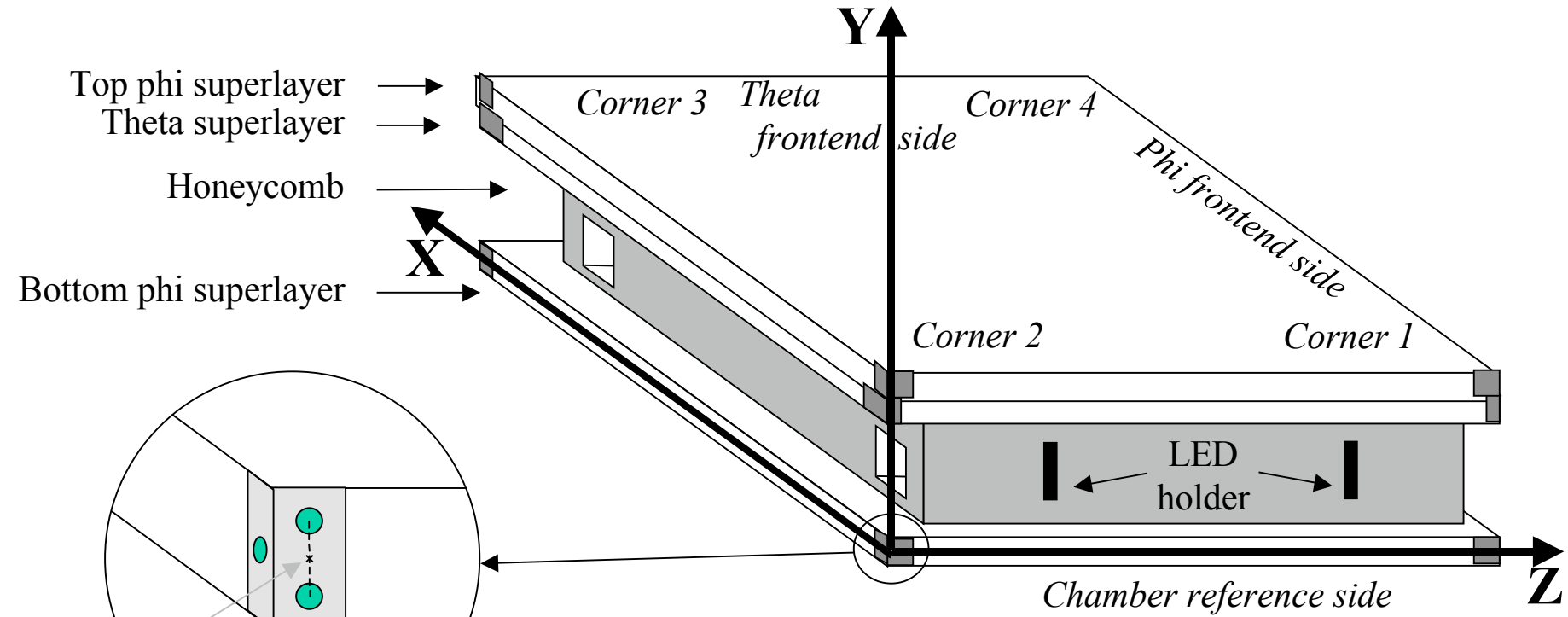
Schematic view of the MB4 chambers.
View from the phi front-end.



The corner block and the target



Chamber corner and target numbering.
(L = bench line number)

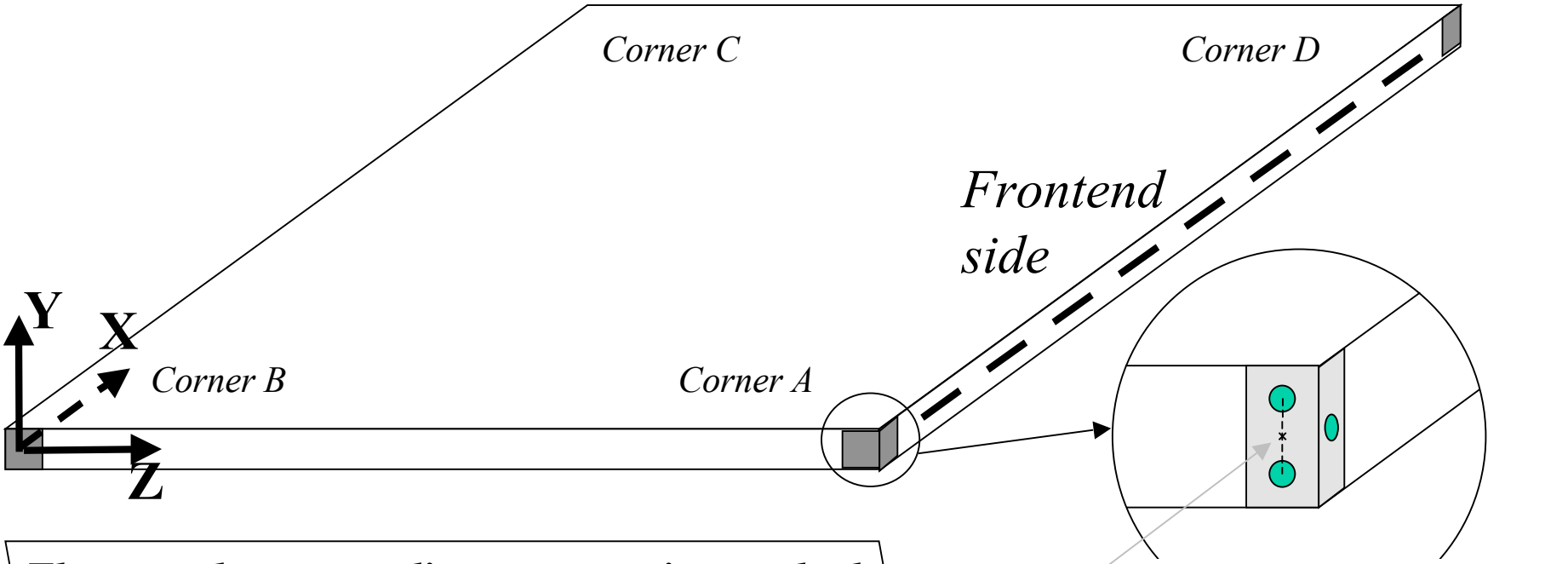


Corner block reference point: middle-point of the line drawn on the surface and connecting the centres of the holes on the two-hole side.

The chamber coordinate system is attached to the corner blocks 1,2,3 of the bottom superlayer:

Origo: ***corner 2.***
Z-axis: ***trough corner 1***
X-Z plane: ***corners 2,3,1.***

Chamber coordinate system



The superlayer coordinate system is attached to the corner blocks A,B,C:

Origo: ***corner B.***

Z-axis: ***trough corner A***

X-Z plane: ***corners B,C,A.***

Corner block reference point: middle-point on the line drawn on the surface and connecting the centres of the holes on the two-hole side.

Superlayer coordinate system

Example: Chamber ***51020101000020***

Specific Code : 010
Chamber Type : MB/W/3/S/+/Right
Measurement Date/Time: 14 Aug 2003. 17:11:46

		Measured			Nominal			Difference		
SL	Corner	X	Y	Z						
1	1	0	0	2465.97	0	0	2466	0.00	0.00	-0.03
1	2	0	0	0	0	0	0	0.00	0.00	0.00
1	3	3074.263	0	0.6251	3074	0	0	0.26	0.00	0.63
1	4	3074.049	0.0272	2466.497	3074	0	2466	0.05	0.03	0.50
2	1	-34.9817	182.564	2465.276	-35	185	2465.5	0.02	-2.44	-0.22
2	2	-34.7151	182.4417	0.1286	-35	185	0.5	0.28	-2.56	-0.37
2	3	3073.242	181.6665	0.2093	3073	185	0.5	0.24	-3.33	-0.29
2	4	3072.915	181.7176	2465.304	3073	185	2465.5	-0.09	-3.28	-0.20
3	1	0.0834	235.8784	2465.917	0	238.5	2466	0.08	-2.62	-0.08
3	2	0.1066	235.9502	-0.2872	0	238.5	0	0.11	-2.55	-0.29
3	3	3074.045	235.3876	0.1248	3074	238.5	0	0.05	-3.11	0.12
3	4	3074.128	235.4698	2465.9	3074	238.5	2466	0.13	-3.03	-0.10

Y-comparison between SL3 and 2 ("difference of the differences"):

Corner	Difference
1	-0.19
2	0.01
3	0.22
4	0.25

Conclusion: the deviation comes from the honeycomb thickness or from our knowledge about it.

Quality by Superlayer

	Measured				Nominal			Difference		
SL	Corner	X	Y	Z						
1	1	0	0	2465.903	0	0	2466	0.00	0.00	-0.10
1	2	0	0	0	0	0	0	0.00	0.00	0.00
1	3	3074.292	0	0.3656	3074	0	0	0.29	0.00	0.37
1	4	3074.241	0.2176	2466.427	3074	0	2466	0.24	0.22	0.43
3	1	0	0	2465.48	0	0	2466	0.00	0.00	-0.52
3	2	0	0	0	0	0	0	0.00	0.00	0.00
3	3	3074.121	0	-0.5053	3074	0	0	0.12	0.00	-0.51
3	4	3074.108	-0.1704	2465.403	3074	0	2466	0.11	-0.17	-0.60

Well within 1 mm (both the form and bending).

Status, future

The geometrical reconstruction program is just a part of the full **calibration software package** that includes the

- operation of the bench,
- raw data acquisition,
- merging of the photogrammetry and camera measurements
- calculation of the chamber geometry and the fork positions
- during all this lots of cross-checks and judgements
- building the database tables
- Display of the info on the WEB.

Two points are not yet fully done:

Calculation of the fork position – the corresponding (external to this project) software had a bug – it seems to be cured, now under test.

The info on the WEB is just starting to appear (still to be improved, completed.

Hopefully we will have all during (starting from) the January calibration run.The aim is to have the full database created and shown on the Web BEFORE the chamber is removed from the calibration bench (similarly to the fork calibration).