

Towards the Next Module as AsianTPC group

Next module:

using sAltro16

corresponding cooling system

probably with PowerPulsing

(integration of readout)

though readout channel is a half of the module

proper gate equipped on the module

idea to reduce module boundary distortion

stable operation

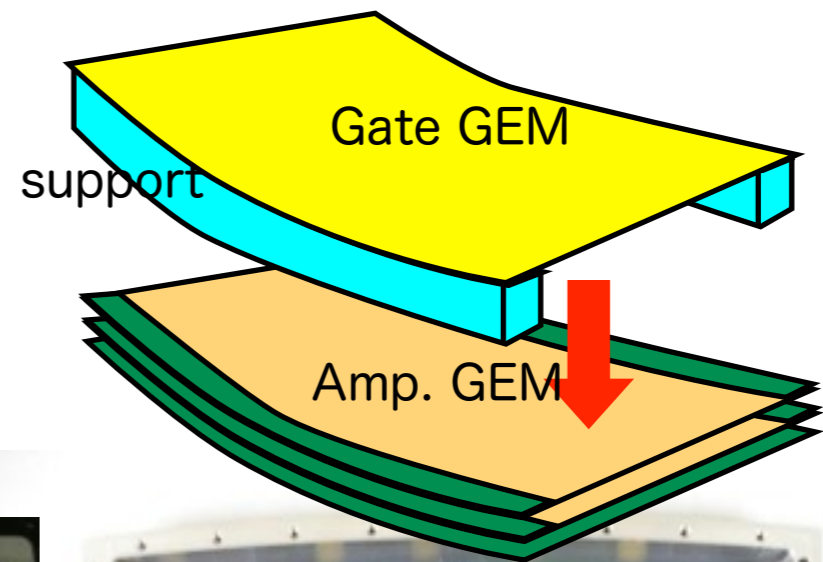
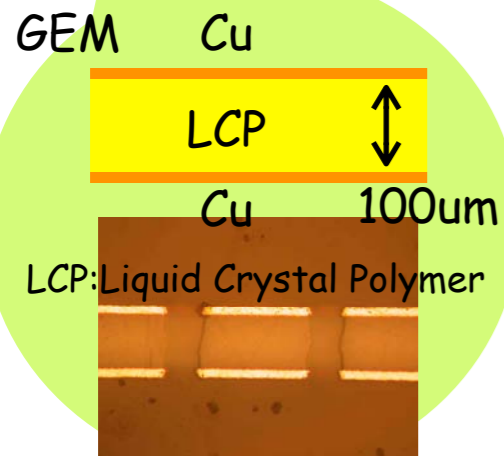
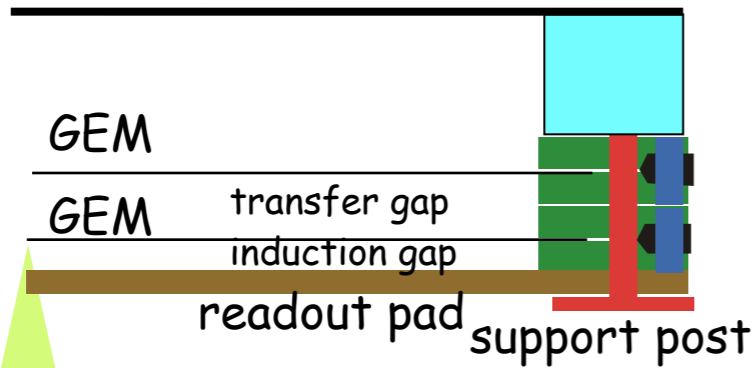
System integration is the most important point

to present a readiness of LCTPC

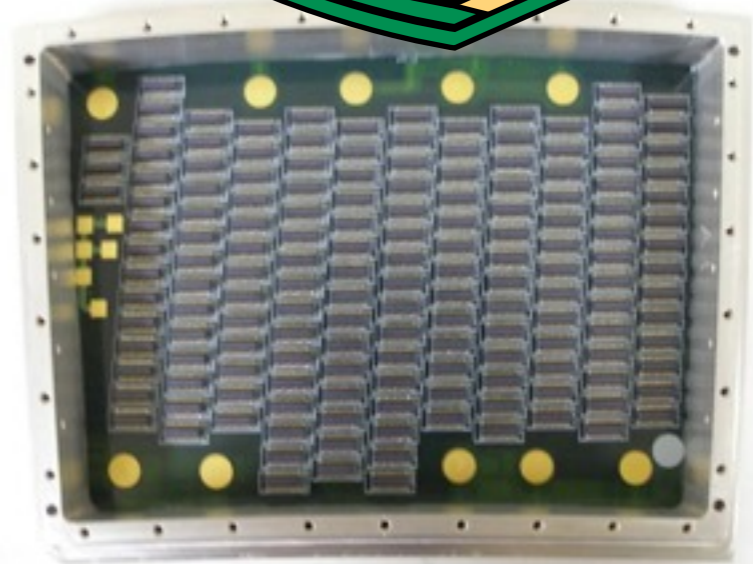
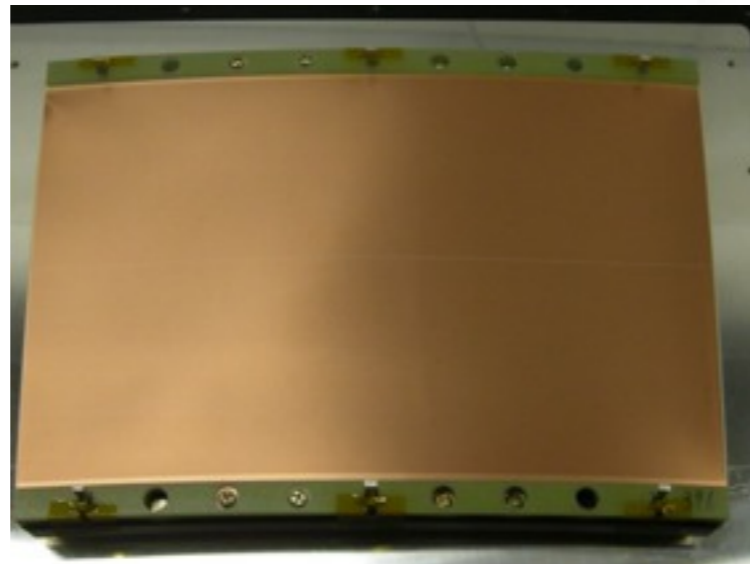
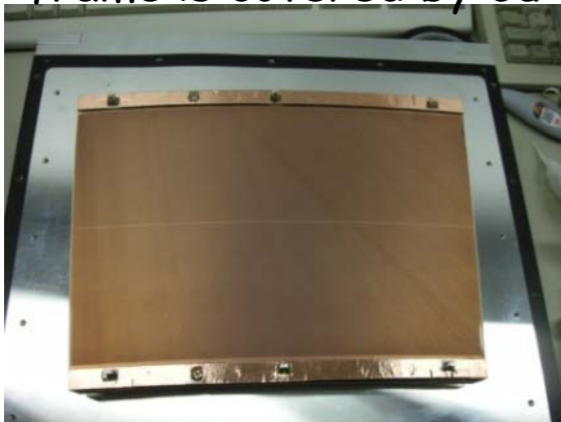
Concept of Asian Module:

no support frame in r direction
double GEM + GEM-type Gate

14um Gate GEM



frame is covered by Cu



Problems:

No side frame : mounting structure
frameless structure give us real gain ??

No answer yet!

distortion / inefficiency

two module test w/Laser

get answer w/in two years

GEM stretching

wide adjustability - complicated adjustment

no reference point

complicated HV connection

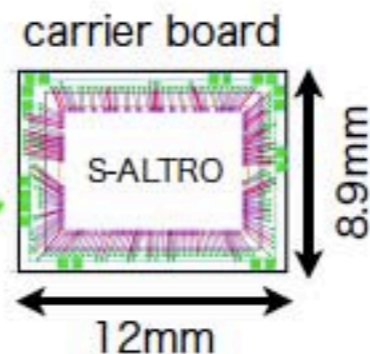
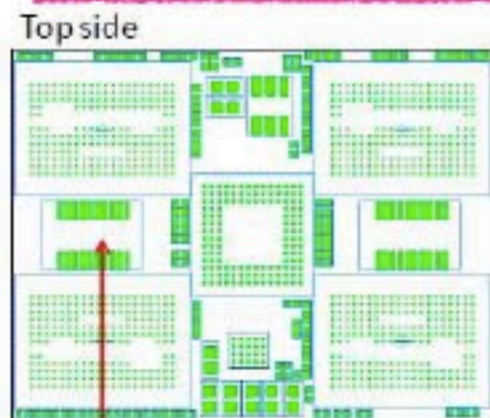
GEM itself was not so tough or seg. was improper

Next module design using sAltro16

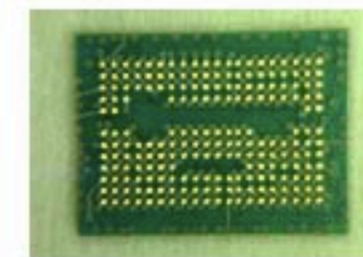
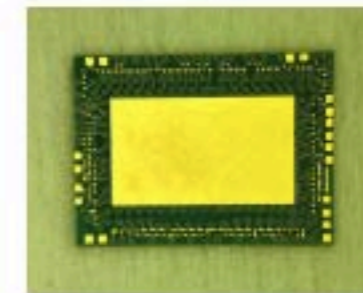
LP1.5 ?

Readout electronics based on S-ALTRO16 chips

Final MCM Bd design by Lund Univ.

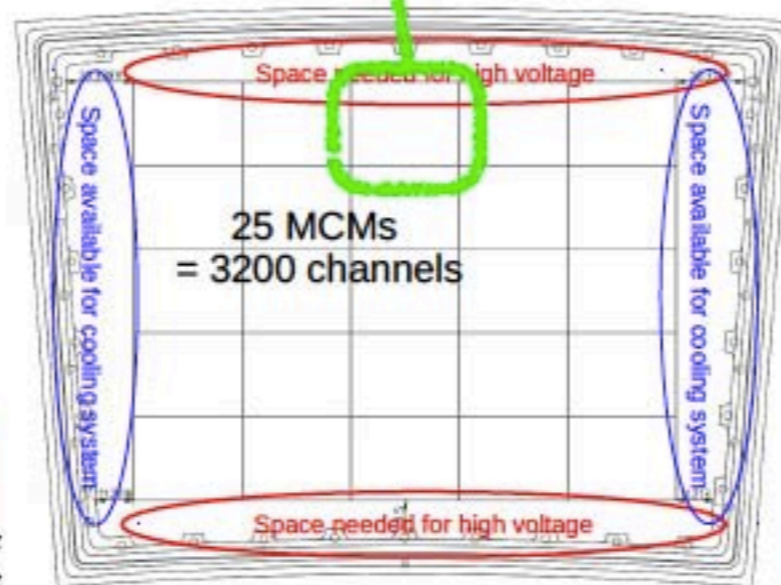
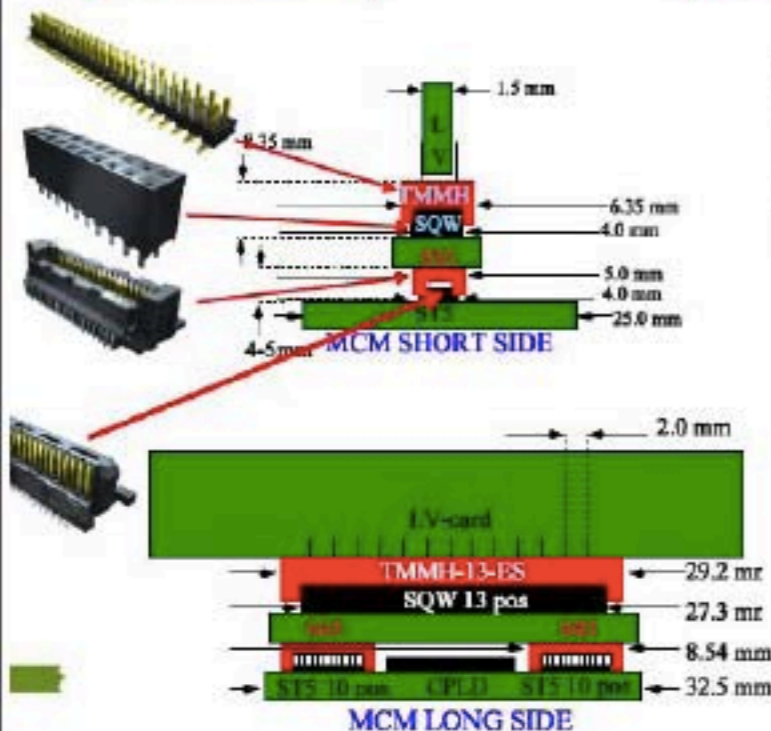


3 CBs were fabricated and ready for test

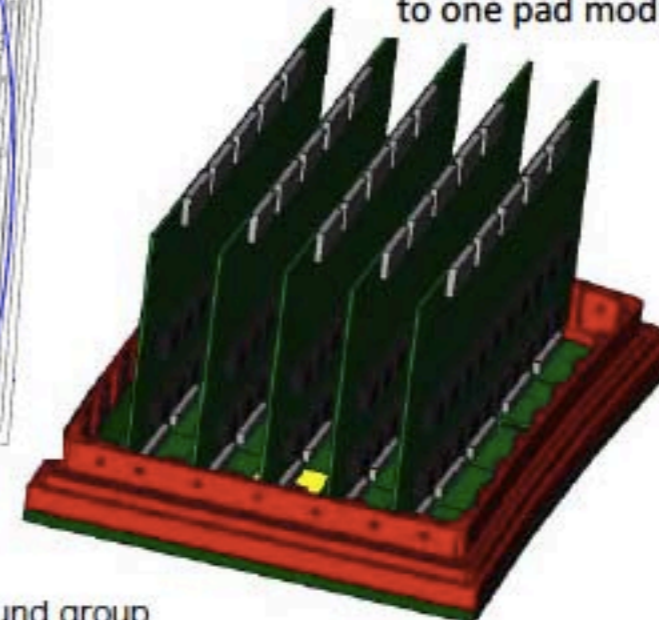


Samtec connectors

Panasonic connectors



LV-boards attached to one pad module



Figures from "Front-end electronics for the TPC in ILD; a status report April 2014," etc. by the Lund group

before designing Next module

need to study electronics & cooling assembly

cooling test board with MCM layout

layout of high conductive material

layout of cooling pipe/pipe routing

LB board

HV

in order to do this

we need to know how to connect MCM to PCB

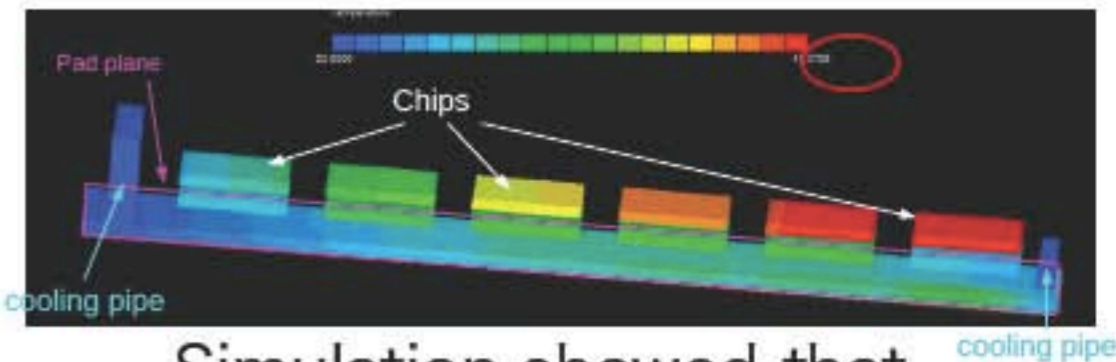
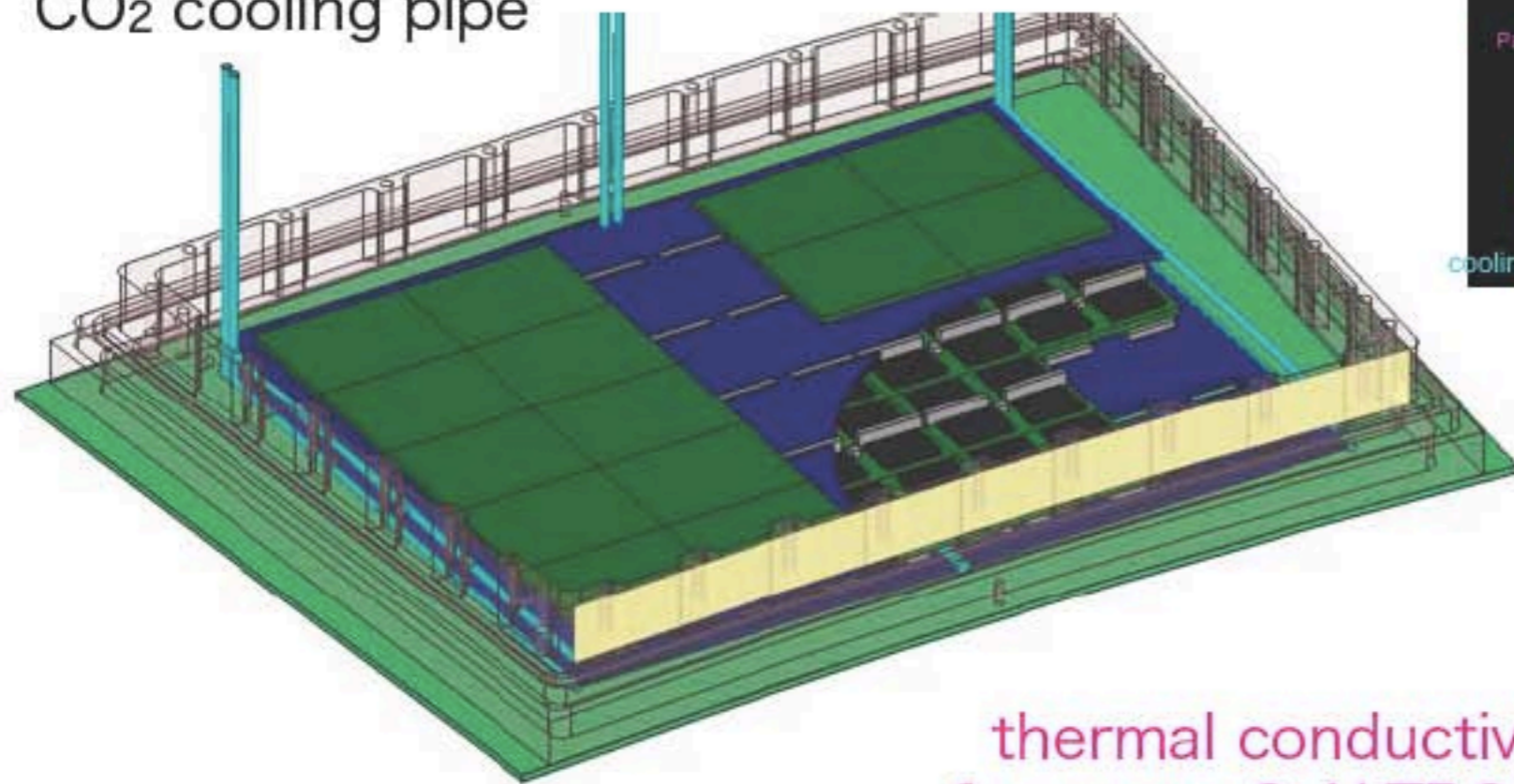
exact geometry of signal end on PCB

I hope this is already fixed in CM

we use BGA

Proposed Cooling for S-ALTRO16-based electronics

CO₂ cooling pipe



Simulation showed that Middle pipe is necessary

thermal conductive plate for upper S-ALTRO16 chips

CO₂ cooling pipe



thermal conductive plate for lower S-ALTRO16 chips and to keep pad-plane temperature

Pad size/layout

same as LP1? though pad length is not optimized

routing ? only a half of them is readable

which area we will be read ?

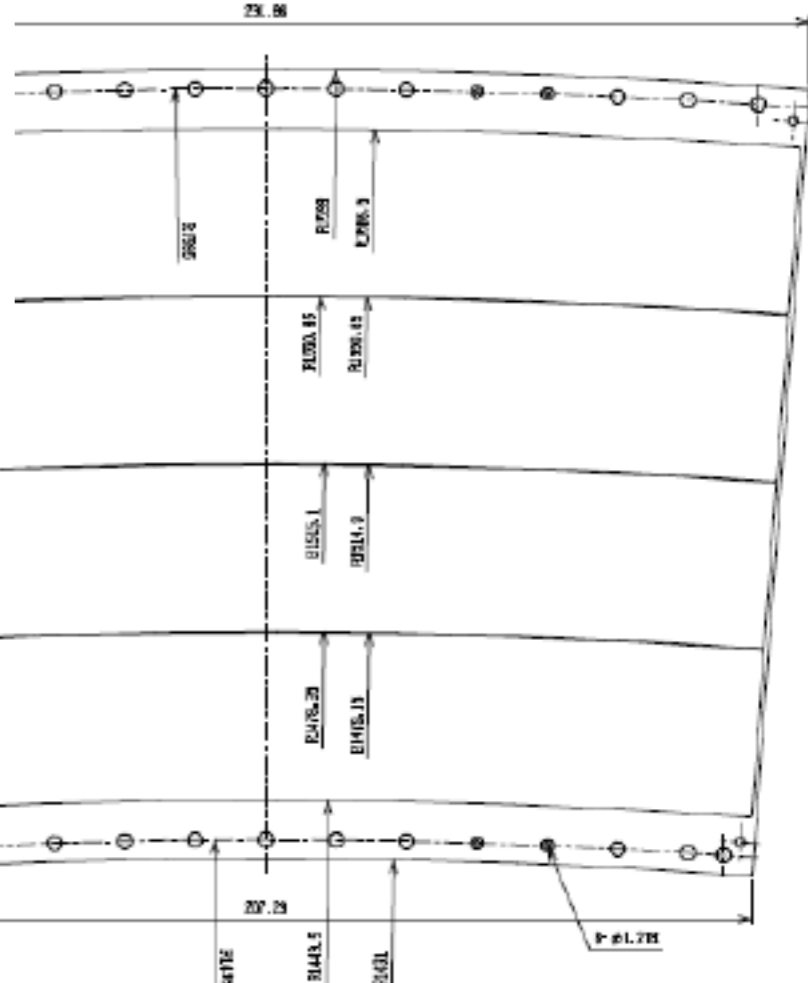
GEM stretch

new aggressive method was proposed 2 years ago
but not realized yet

we have to accelerate this test to be applicable to next module



tension pin HV connection



Mock up drawings

Gate will be reported by Katsumasa

**Honeycomb (300um pitch/30um lib) is sure
(150/15) is very difficult now
not too fragile to handle**

electron transmission

ion blocking power

not to deteriorate the resolution

