

GEM Updates from China

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for the SoLID-GEM Chinese Collaboration

University of Science and Technology of China

SoLID Collaboration Meeting

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JLab

SoLID-GEM Chinese Collaboration

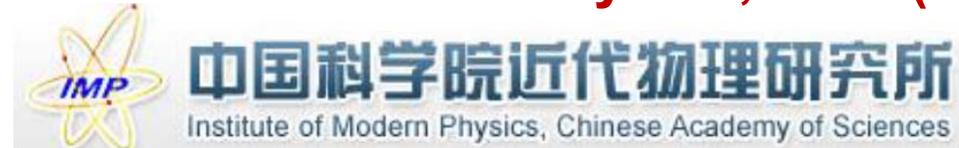
China Institute of Atomic Energy (CIAE)



Lanzhou University



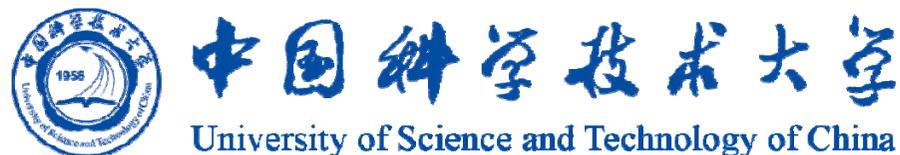
Institute of Modern Physics, CAS (IMP)



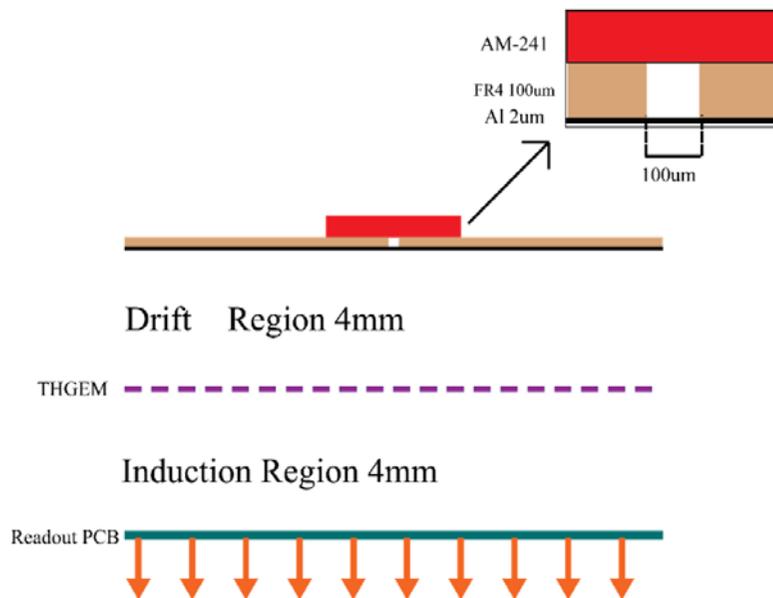
Tsinghua University



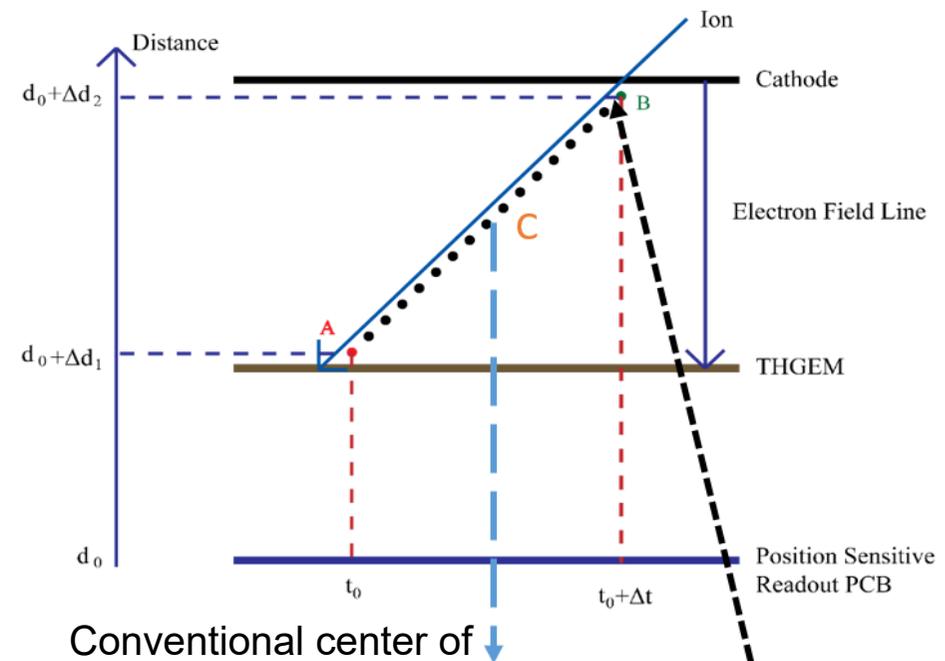
University of Science and Technology of China (USTC)



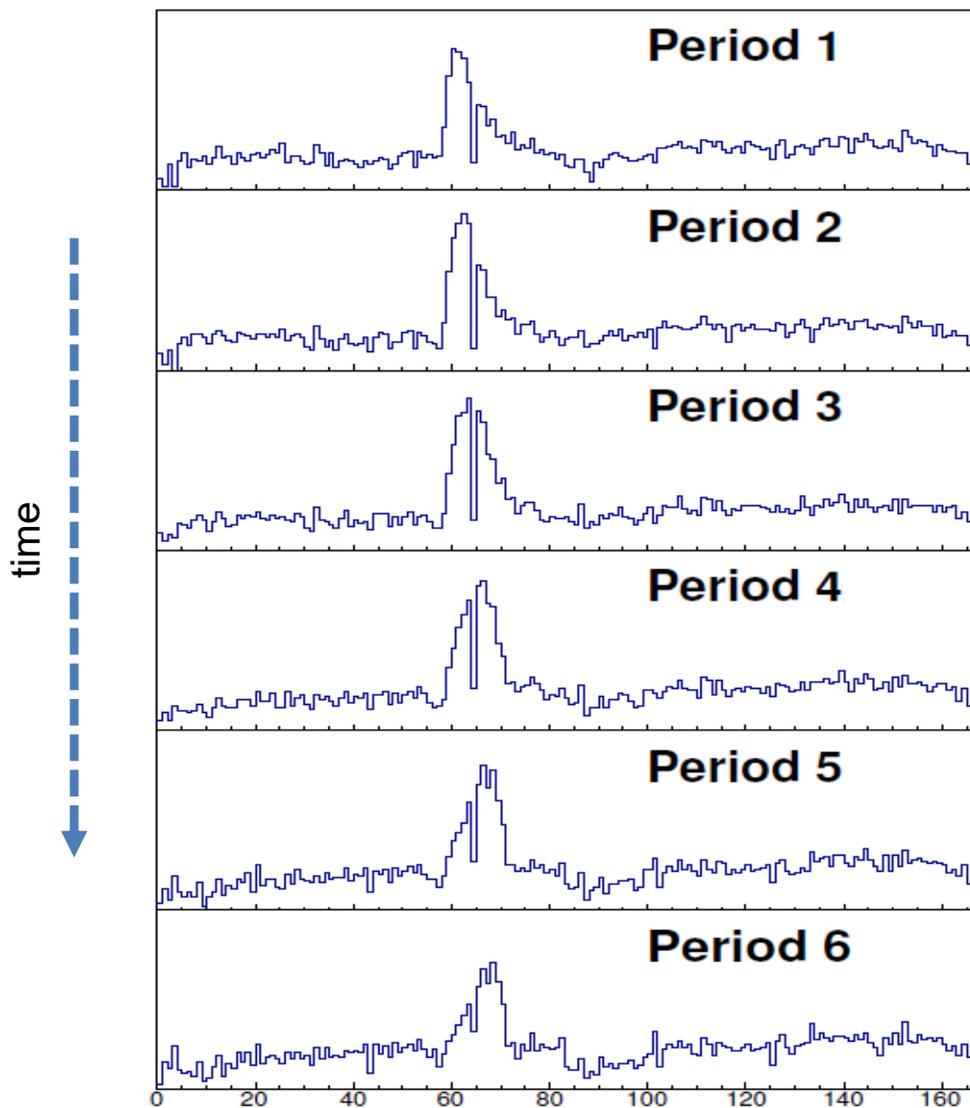
- Improve the reconstruction of neutron interaction point using a THGEM detector with APV25 readout



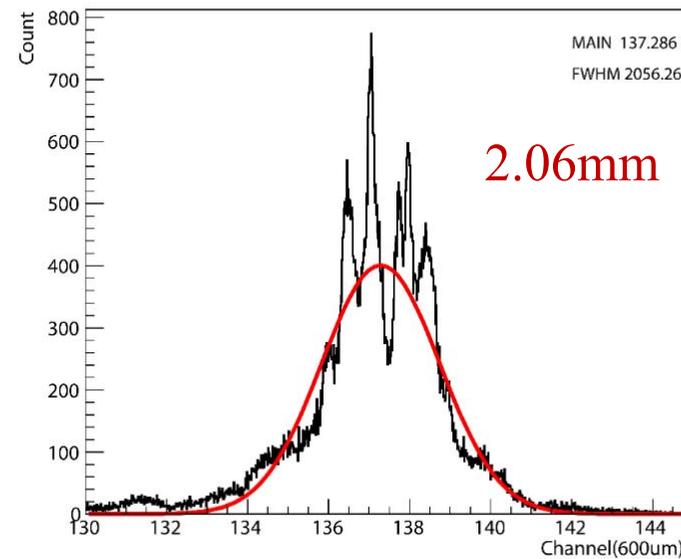
A THGEM neutron detector tested with a ^{241}Am source



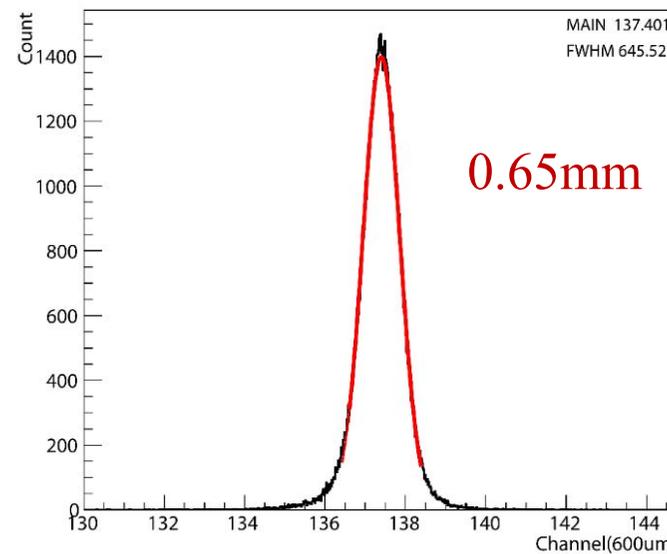
Test result



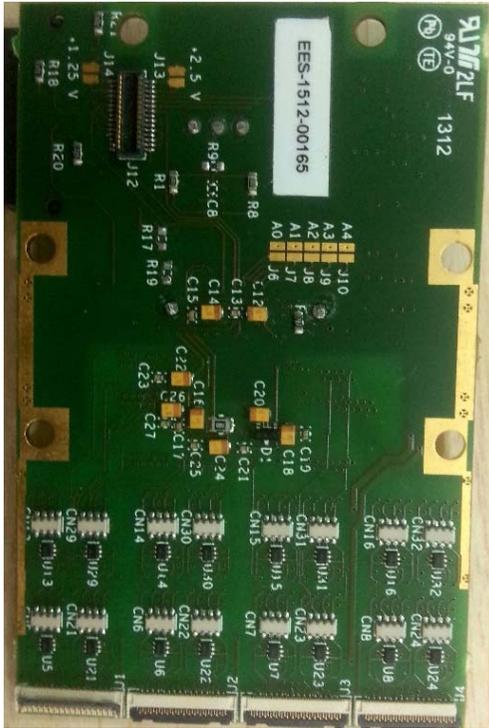
center of gravity method



Micro-TPC method



Existing readout



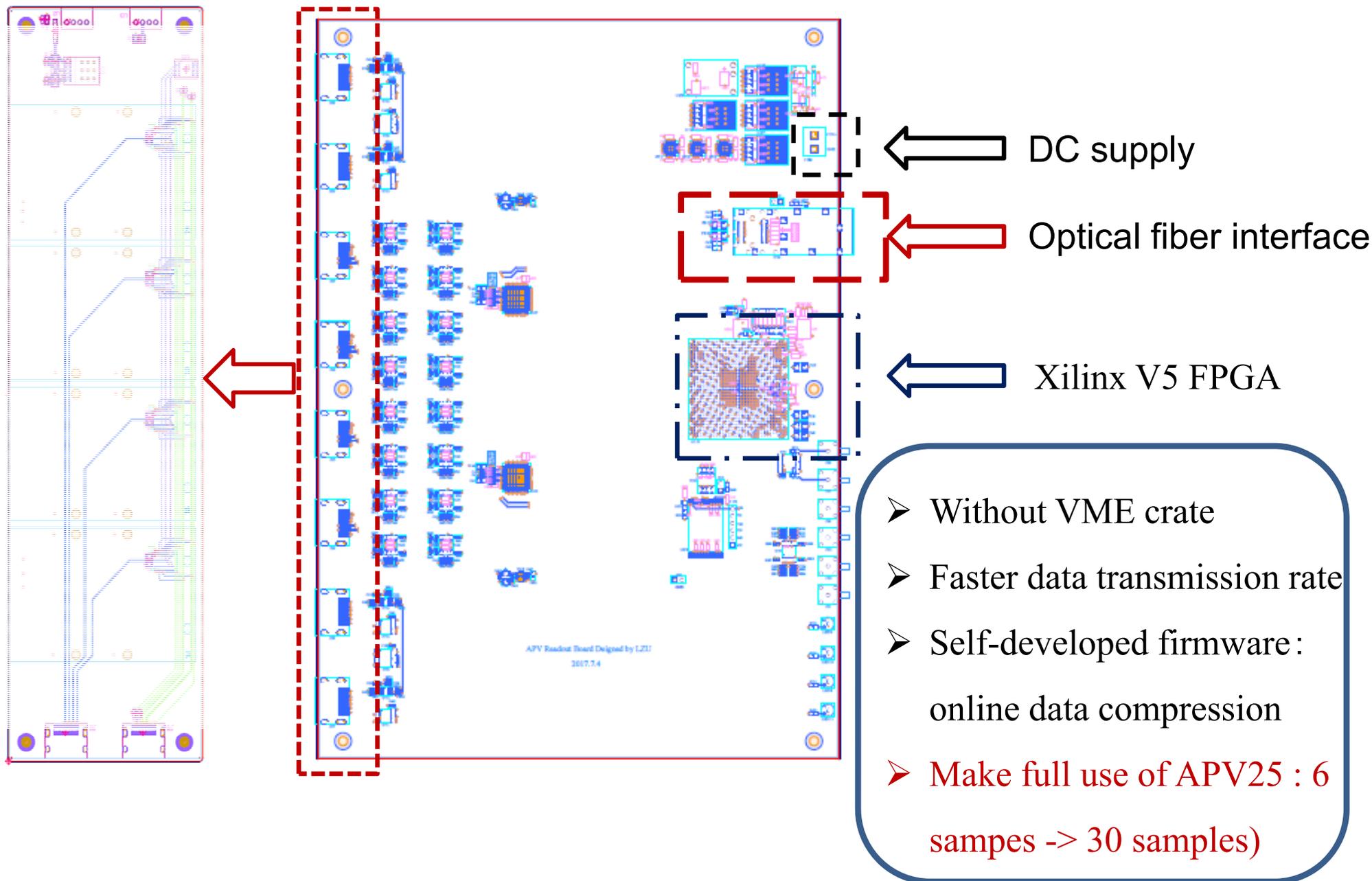
- VME module : a bit too heavy
- No source code. No possibility for further development
- HDMI 29P: obsolete and phased out

Drawbacks and disadvantages

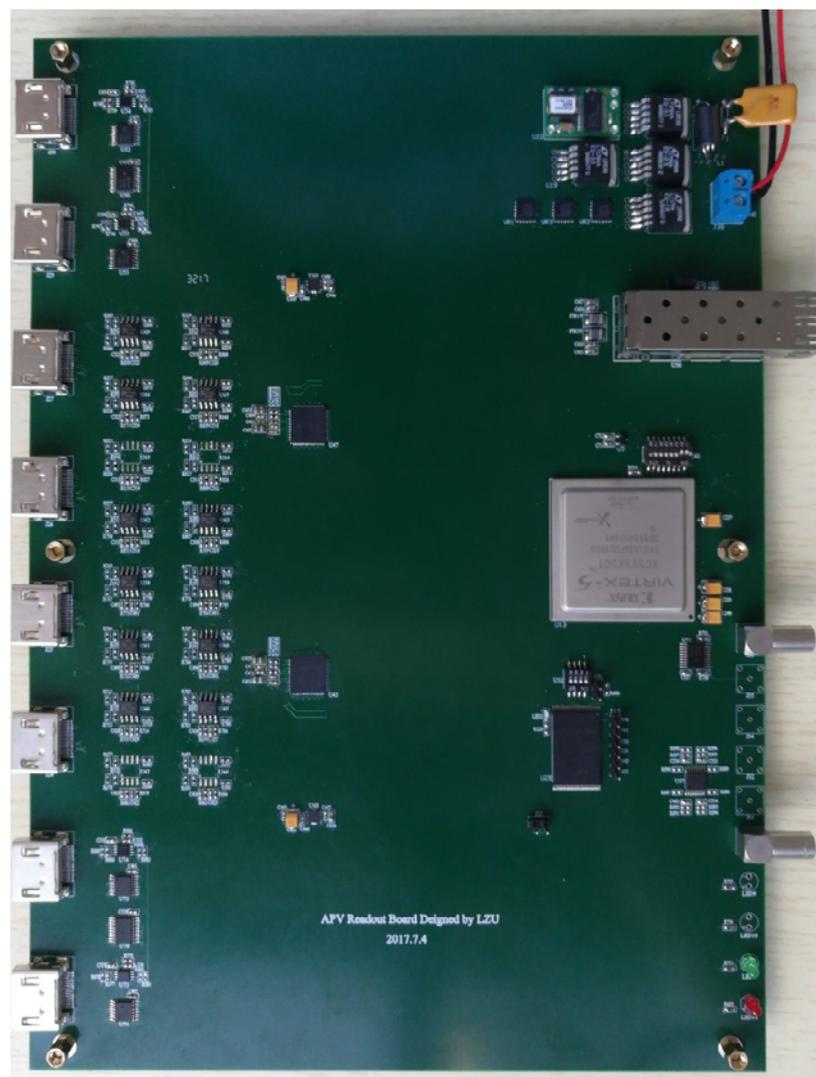
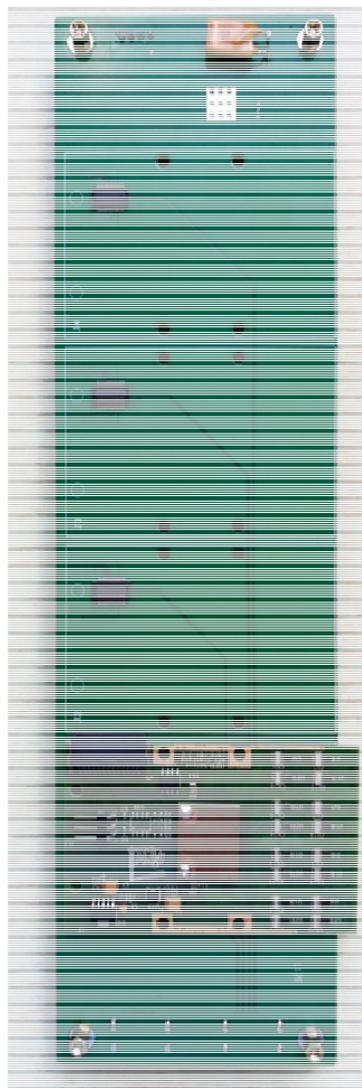
128-channel APV25 hybrid
obtained through collaboration
with JLab



Design of new readout



Development of the new readout



Firmware under
development

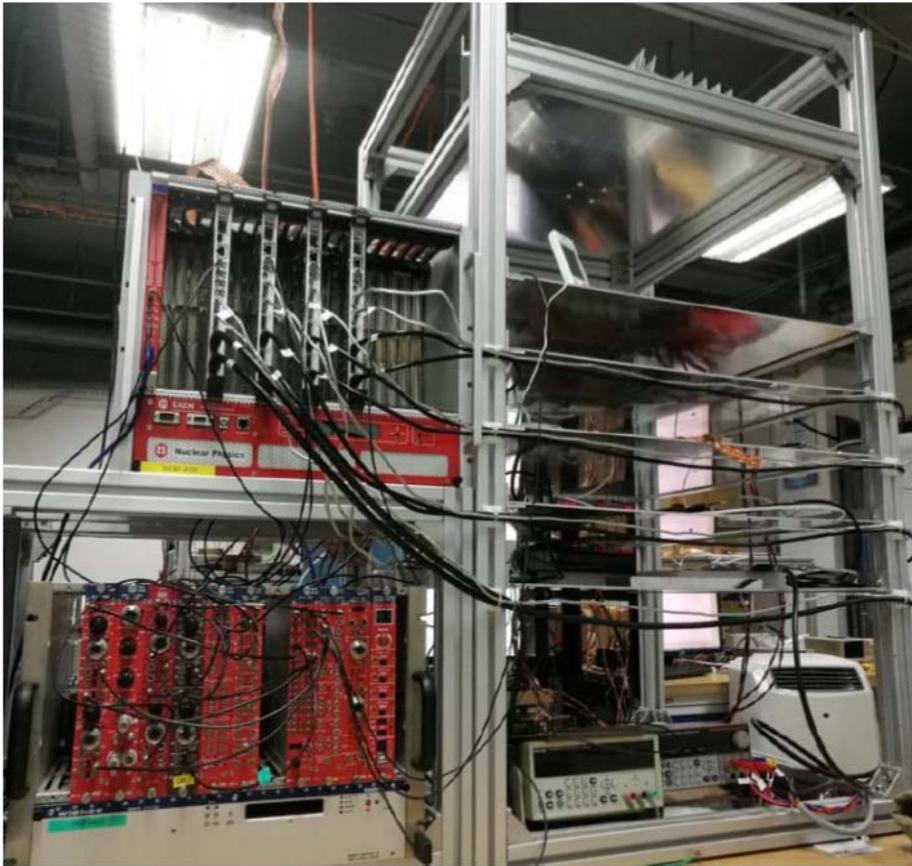
APV Readout Board Designed by LZU

2017.7.4

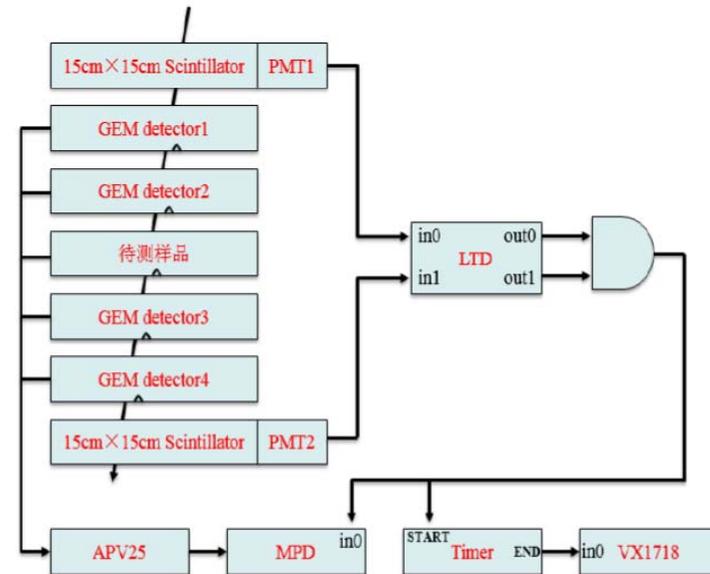
USTC

- A cosmic-ray telescope with GEM detectors
 - Hardware components have been all set up
 - DAQ and user interface under development
- uRWELL detector R&D

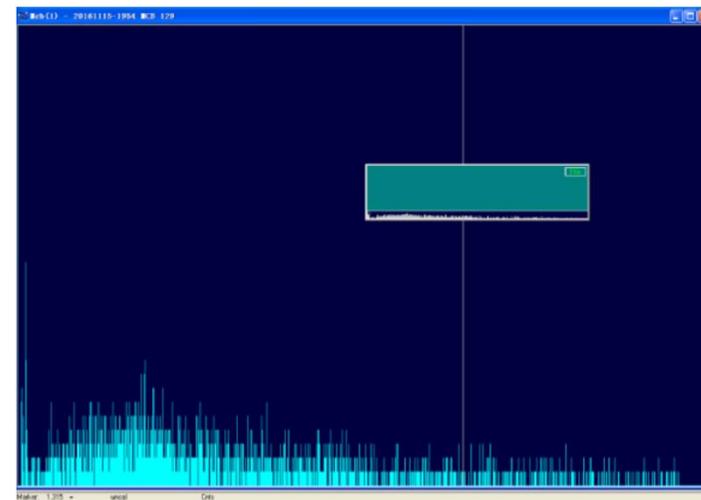
The GEM cosmic-ray telescope



AVP25-MPD readout

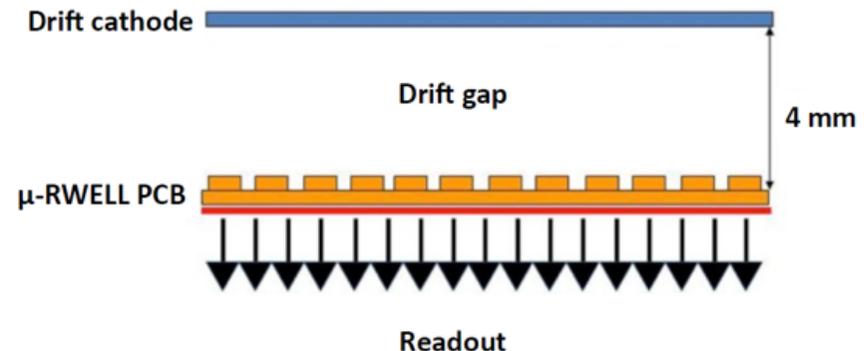
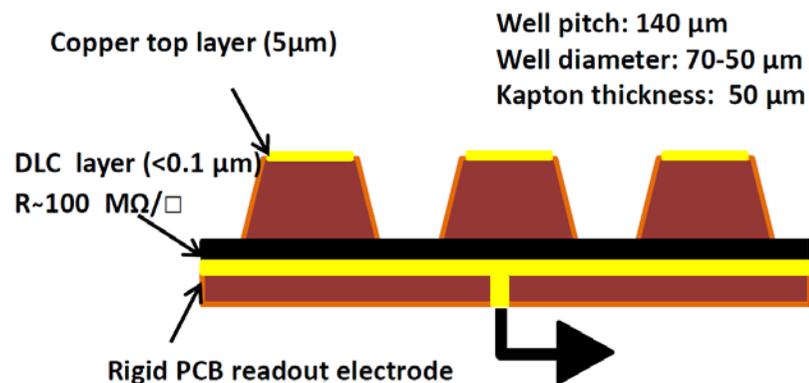


Charge distribution of comic-ray signals



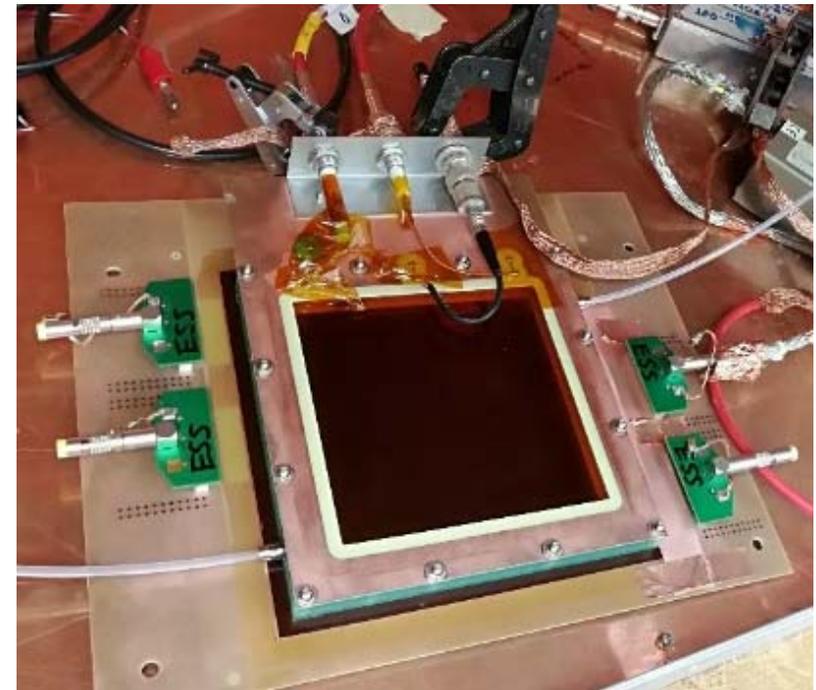
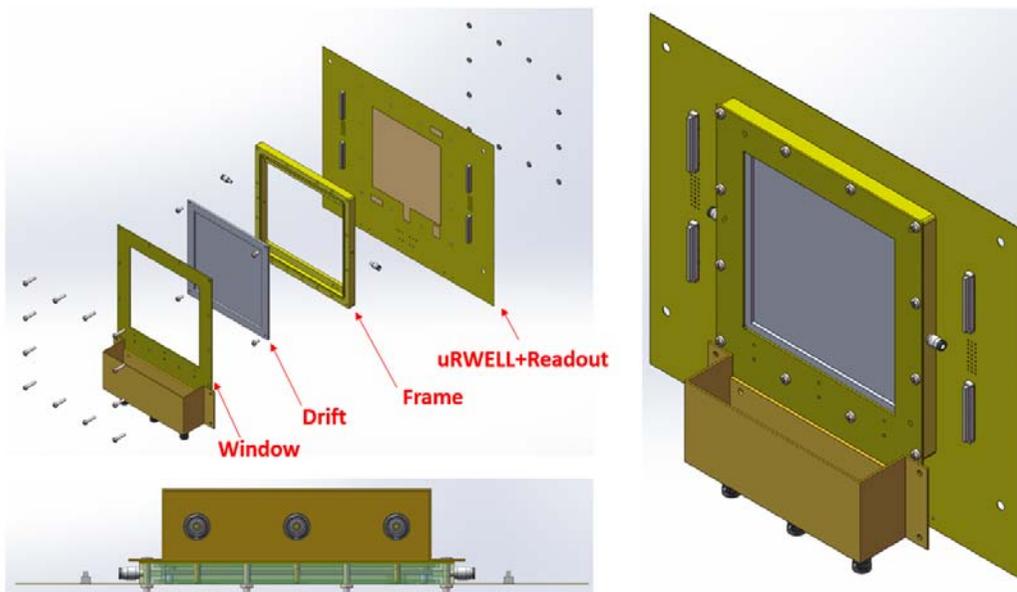
uRWELL structure

- A novel MPGD technology
 - No gluing, no stretching, very compact, easy for production of large-size detectors
 - Two schemes
 - low rate : close to mature
 - high rate: still under development



uRWELL Prototypes

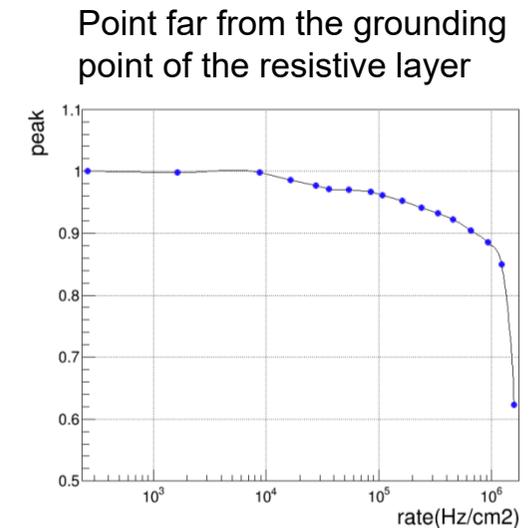
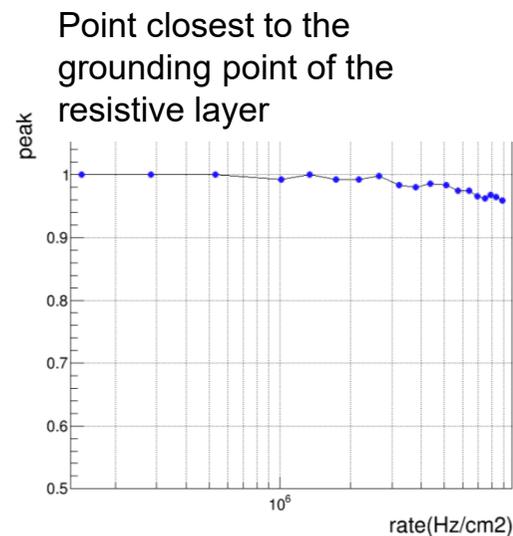
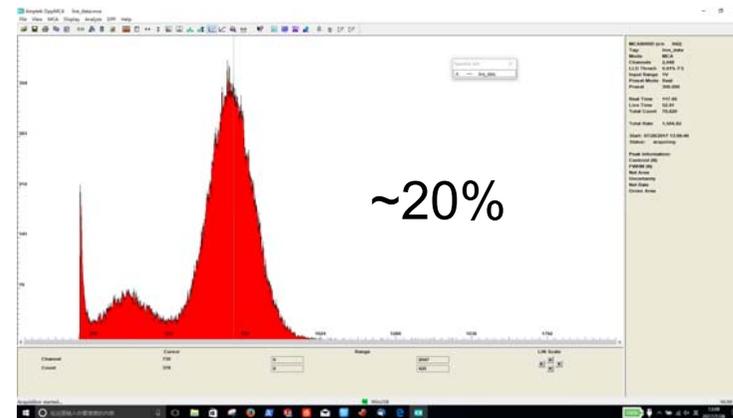
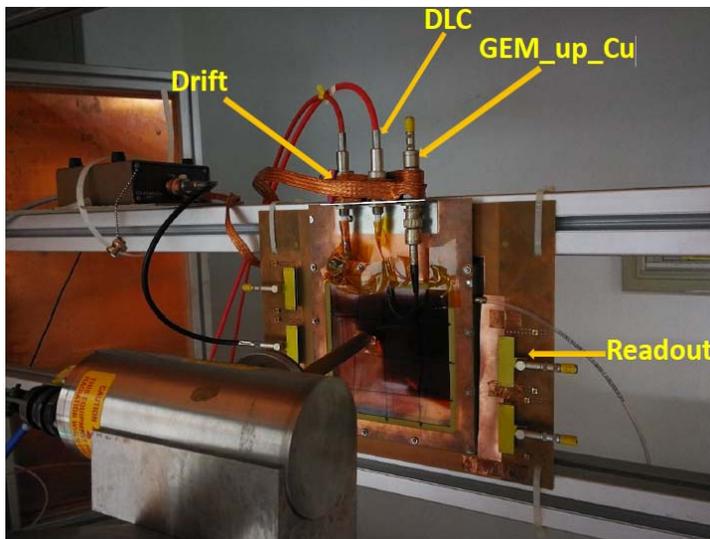
- Have designed and built two 10cm*10cm uRWELL prototypes (screening printing and DLC resistive layers)



Lab test

- Tested the prototype using X-rays
 - Energy resolution
 - Rate capability

Ar93% : CO₂7%



Beam test

- Test beam at CERN in the past summer
- Data analysis still ongoing

