

The XXIV International Scientific Conference of Young Scientists and Specialists



«FFD electronics test-bench»

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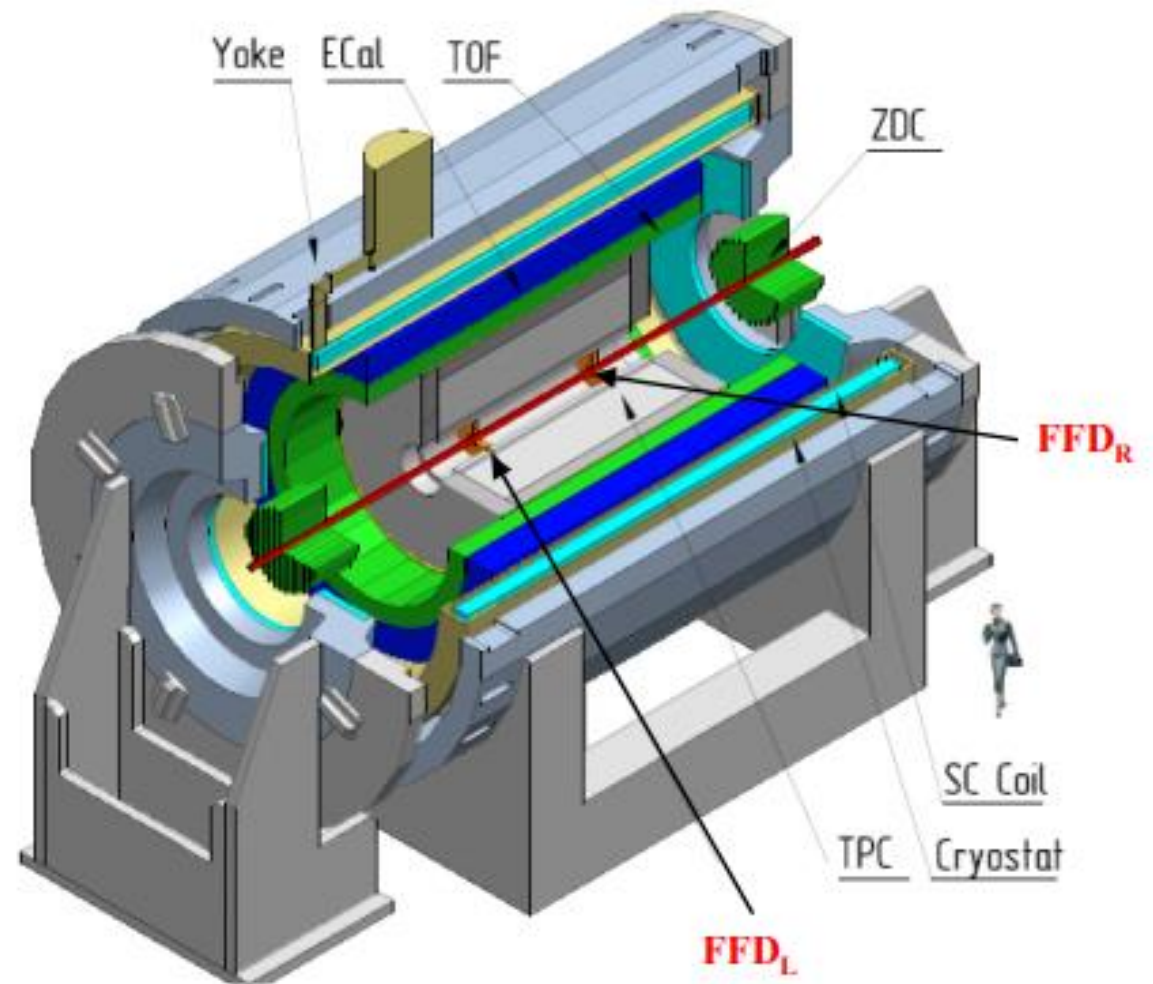
- **Introduction**
- **FEE test card**
- **Analog pulse generator**
- **LVDS pulse generator**



Aims of FFD

- Fast and effective triggering events of heavy ion collisions in center of MPD setup
- Generation of start pulse for TOF detector with picosecond time resolution

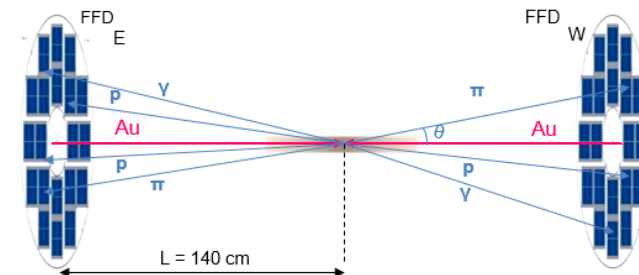
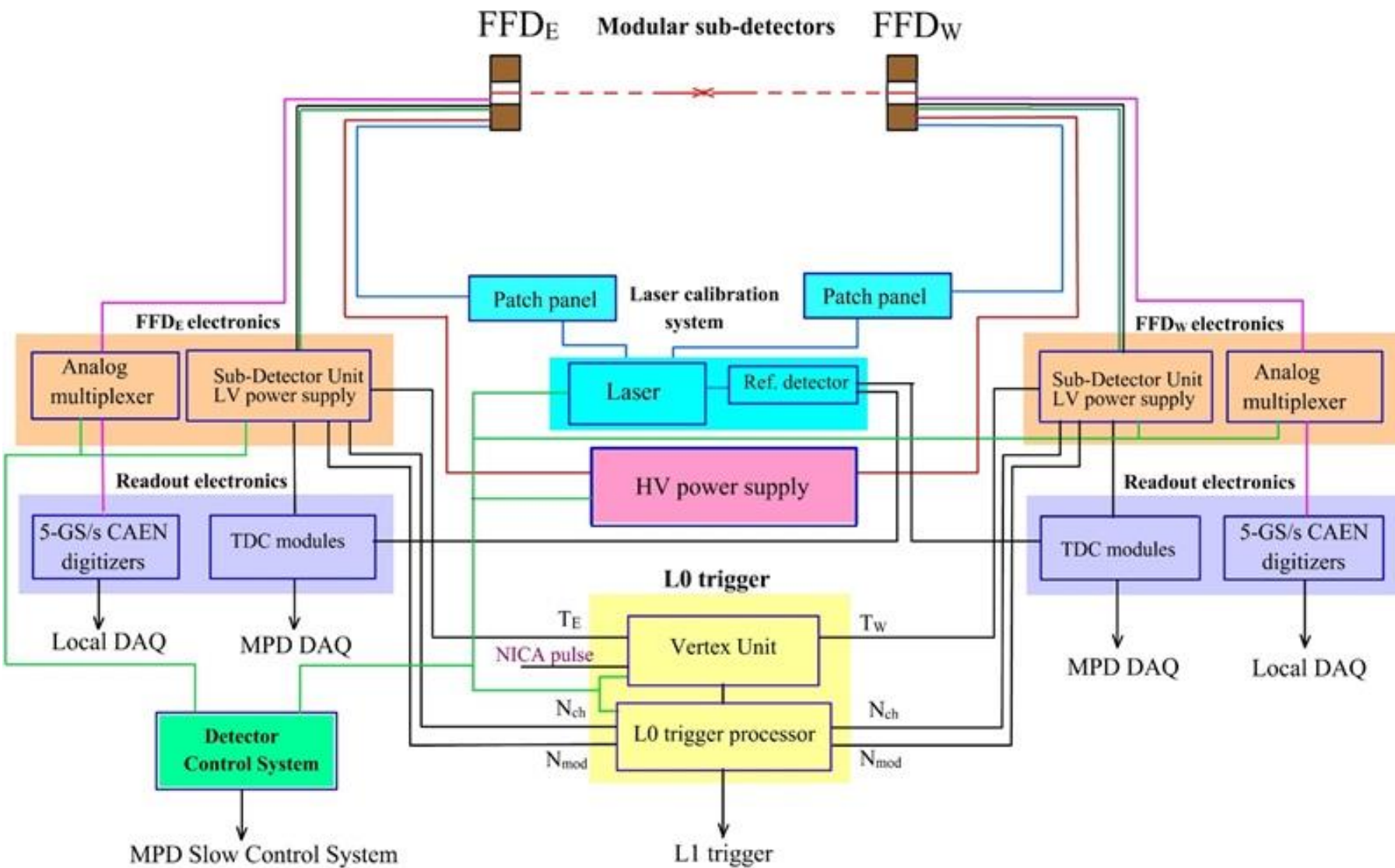
Number of arrays	2
Number of modules	20 x 2
Number of channels	80 x 2
Required time resolution, σ	< 50 ps
Operation in magnetic field, B	0.5 T



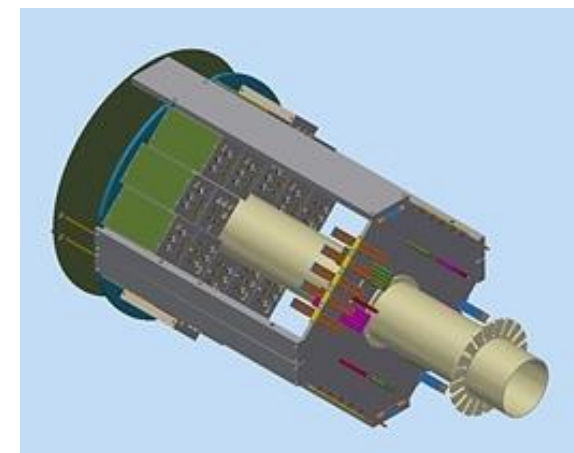
FFD layout in the MPD setup



Scheme of the FFD system



A schematic view of the FFD sub-detector

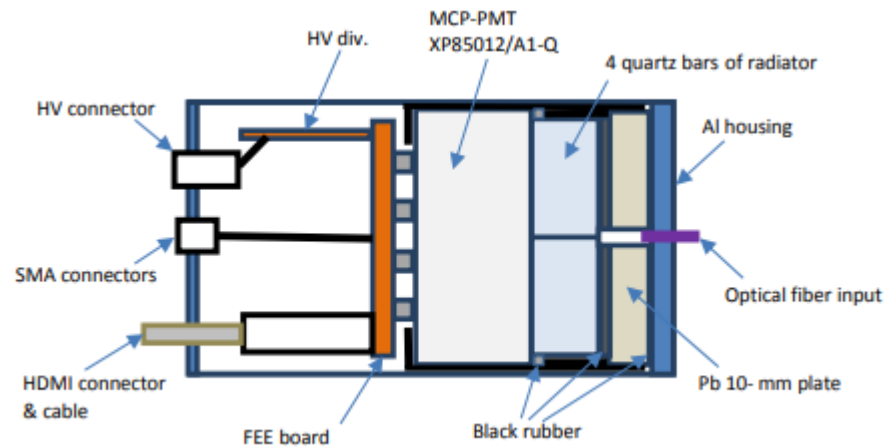


The FFD sub-detector assembly

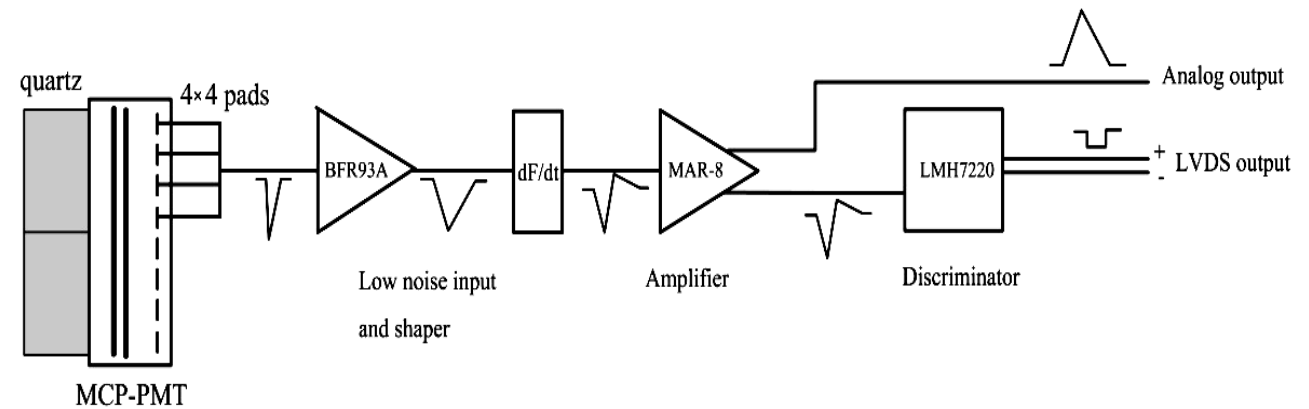
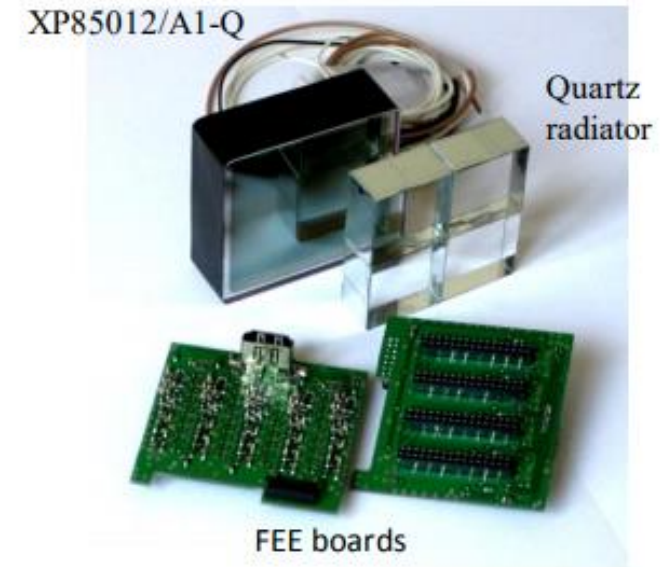
FFD module design



A view of FFD modules

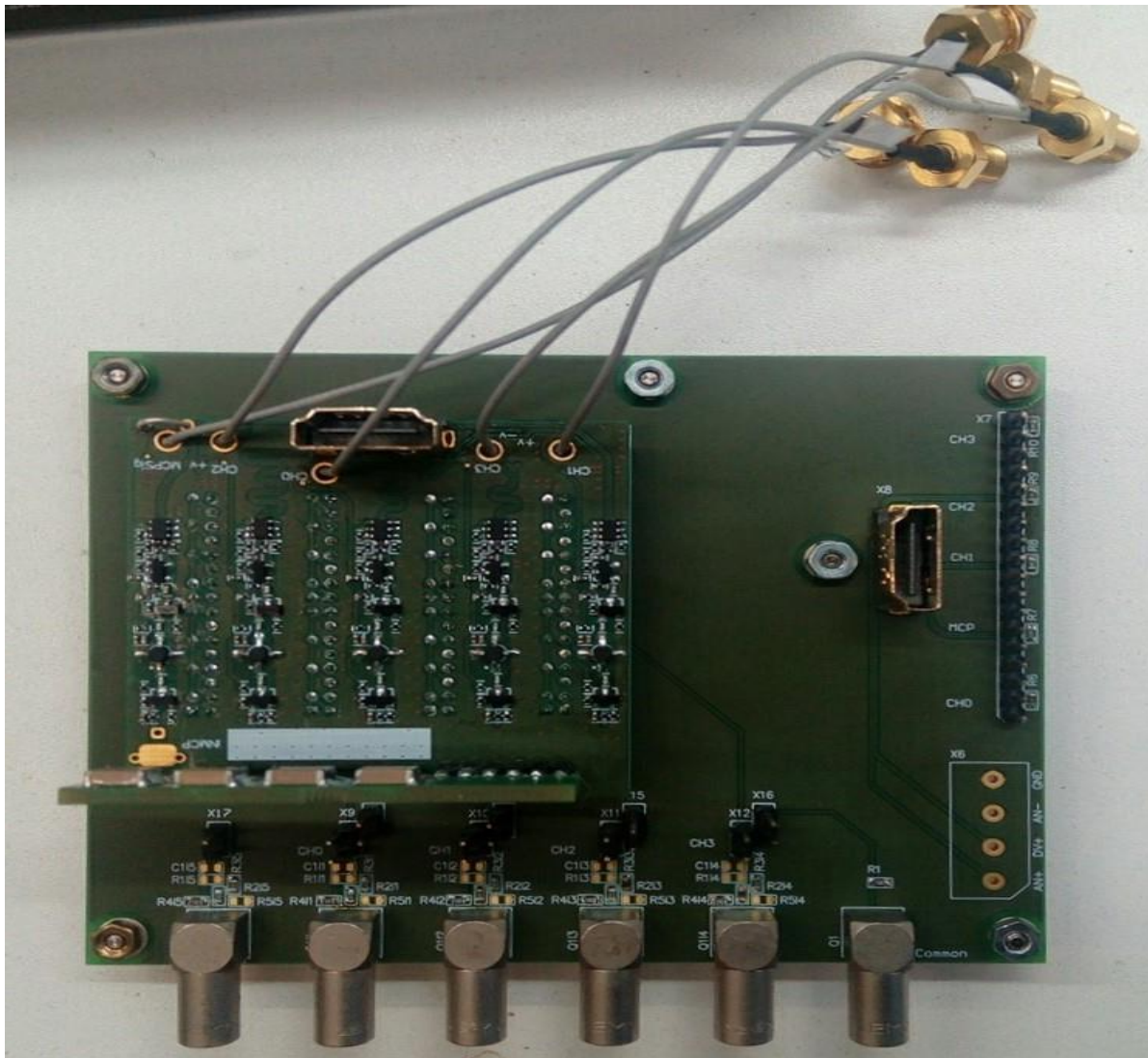


A scheme of the FFD module

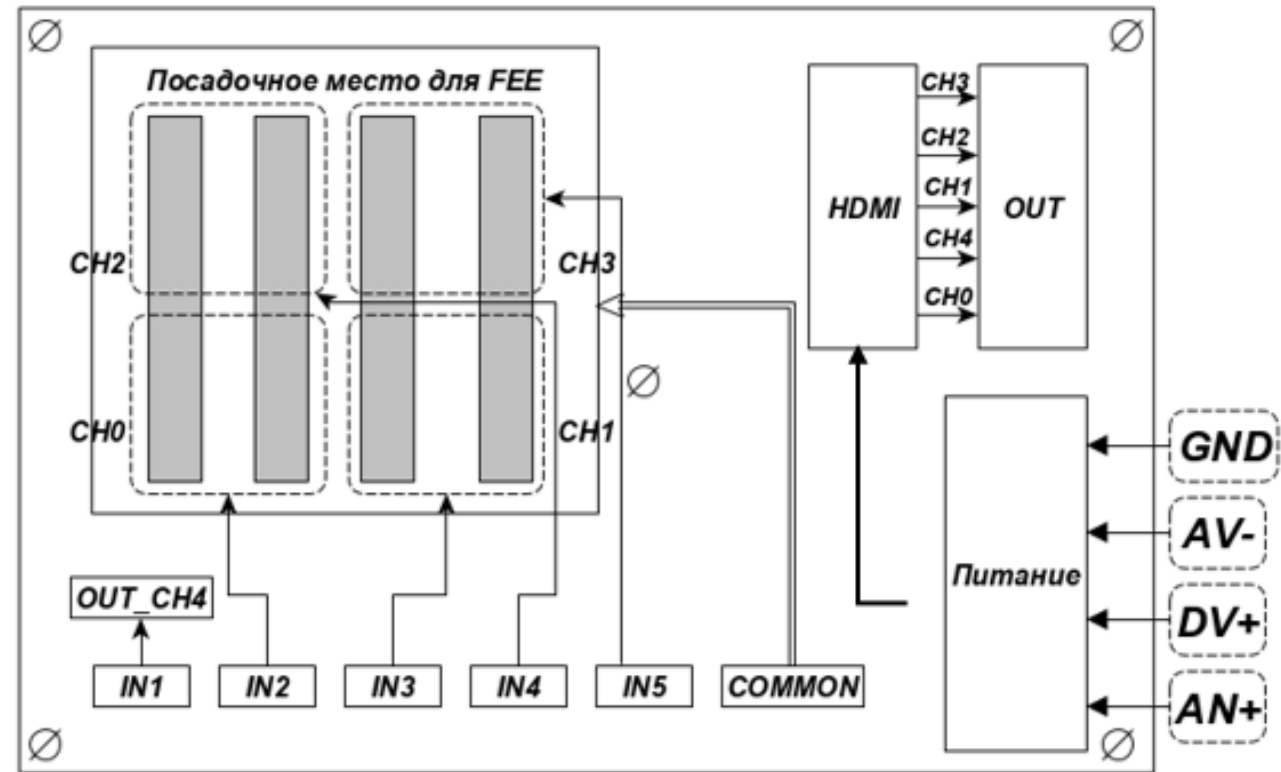


A functional scheme of a single FFE channel

FEE test card



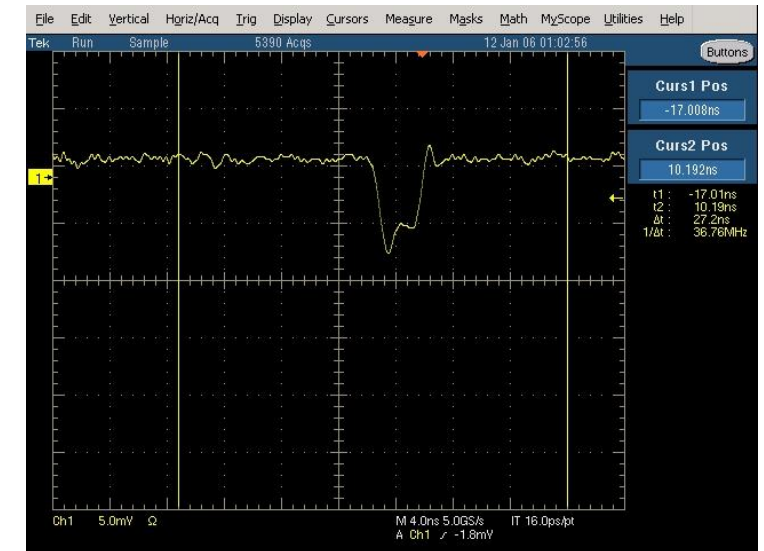
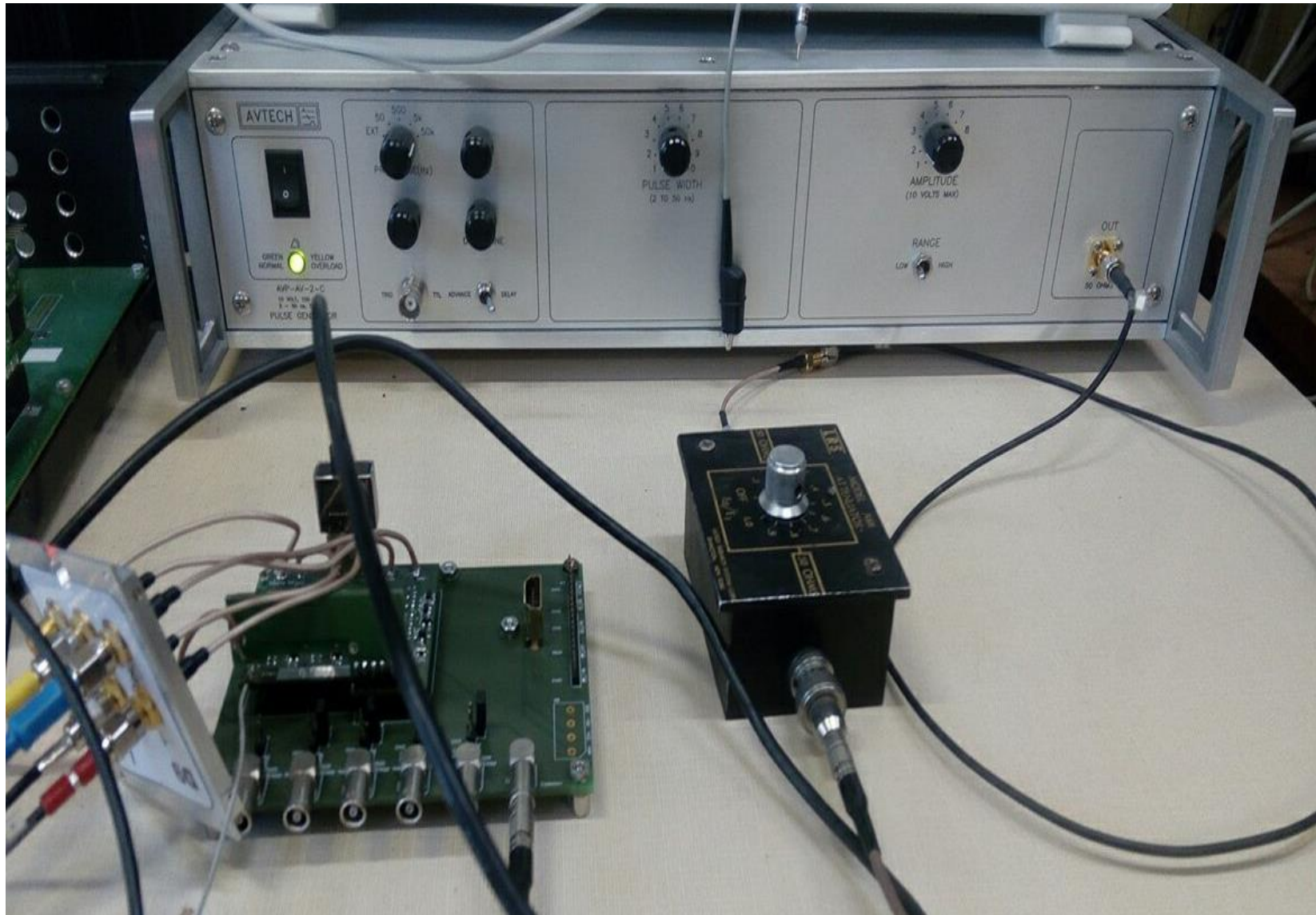
A view of FEE test card



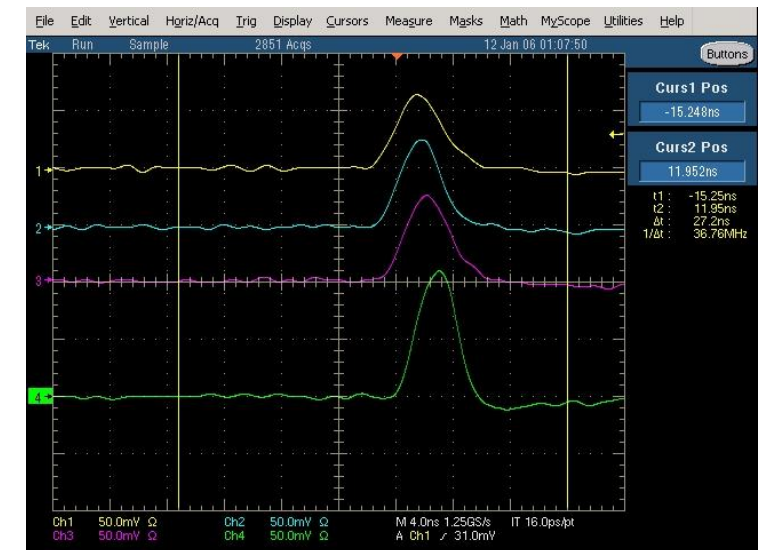
A functional scheme of the FEE test card



Tests of the FEE



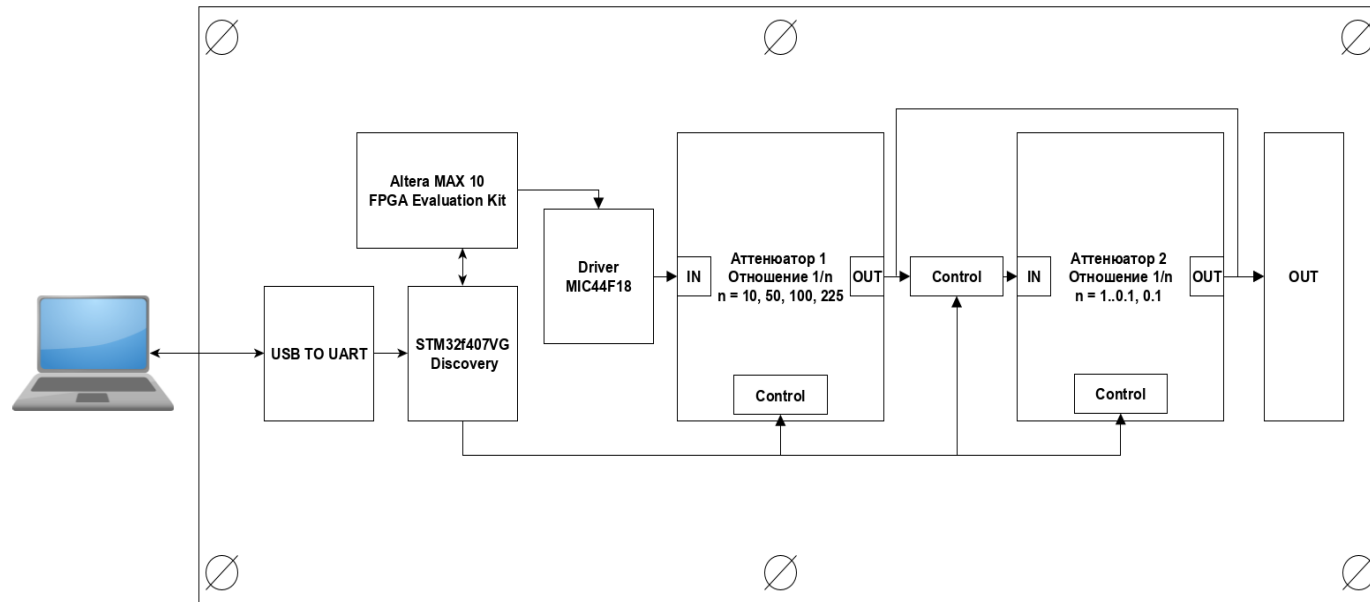
Input signal for the FEE: 5 mV 4 ns



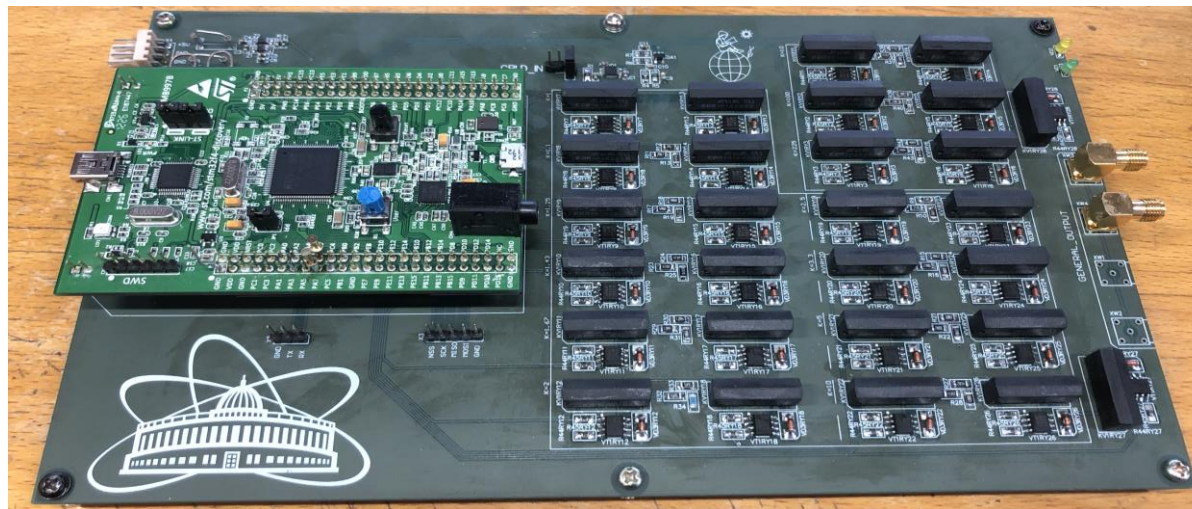
Output signal for the FEE: 5 mV 4 ns



Analog pulse generator



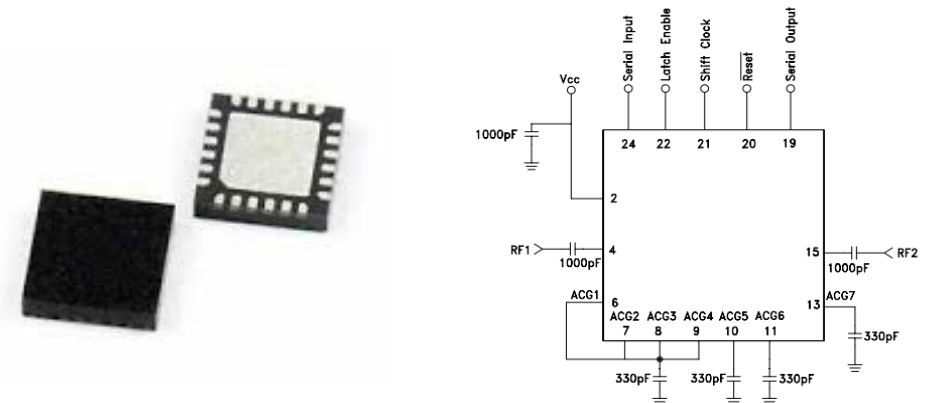
A functional scheme of the prototype analog pulse generator



A view of the prototype analog pulse generator

Found problems:

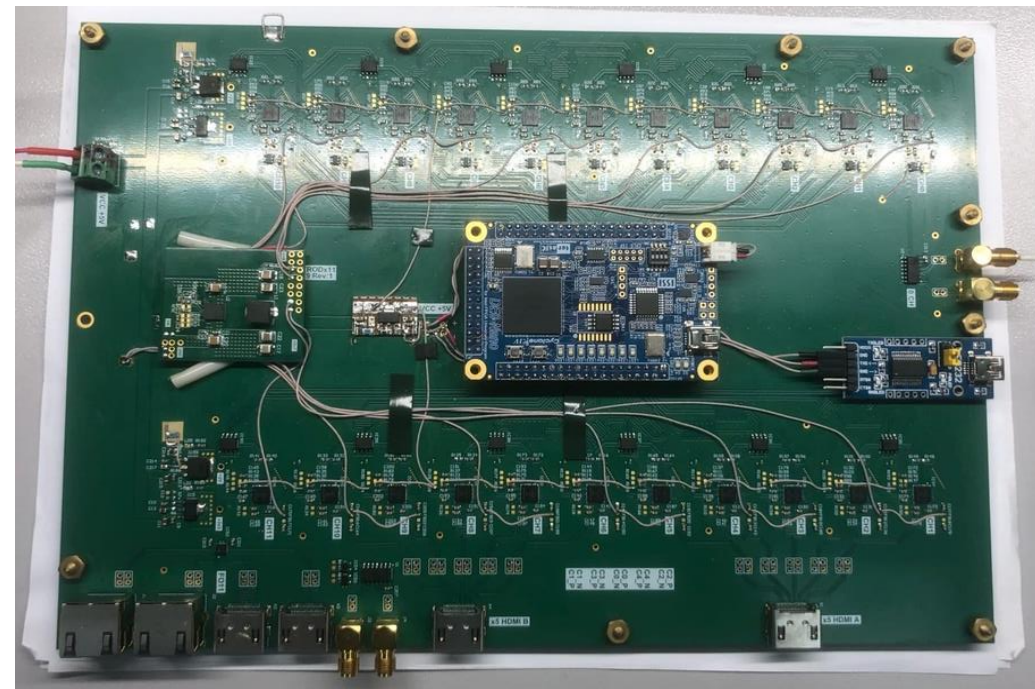
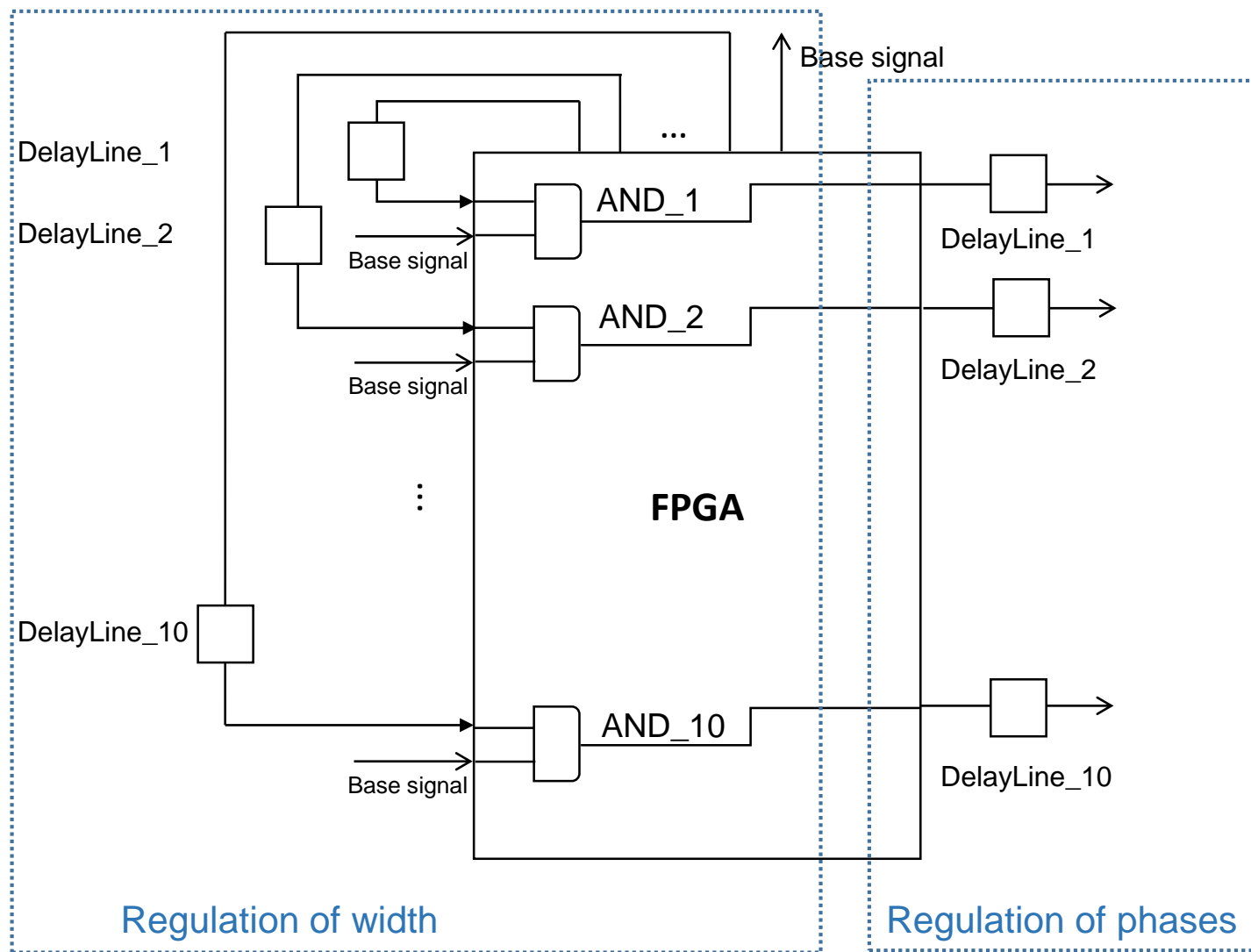
- The driver MIC44F19 isn't able to transmit short signals (a signal duration < 8 ns);
- High distortions of the signal (an attenuated signal < 50 mV).



A view of the digital attenuator



LVDS pulse generator







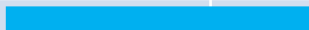




A view of the LVDS pulse generator



Conclusions

1. **The FEE test card** is developed and tested.
2. **The prototype of analog pulse generator** is developed and now is modifying.
3. **The LVDS pulse generator** is in a progress.

Systems	2018	2019	2020	2021
FEE test card	  			
Analog pulse generator		  		
LVDS pulse generator		  		

 - design, R&D  - production  - tests

Thank you for your kind attention!

