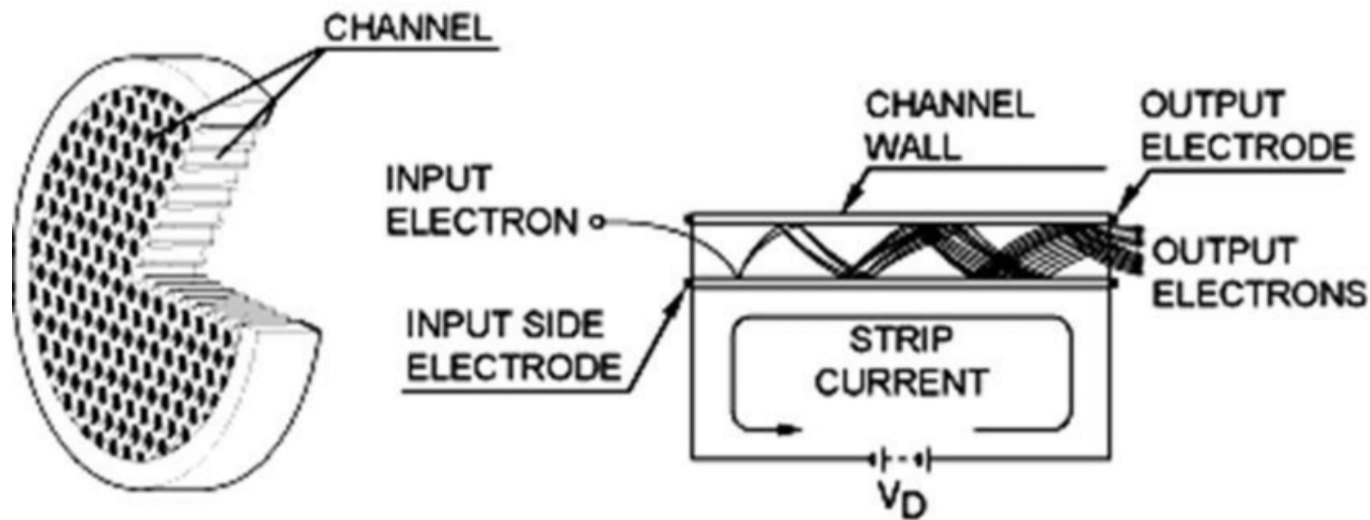


High gain MCPs with monolayers of Al₂O₃ for Fast Beam-Beam Collisions Monitor at NICA

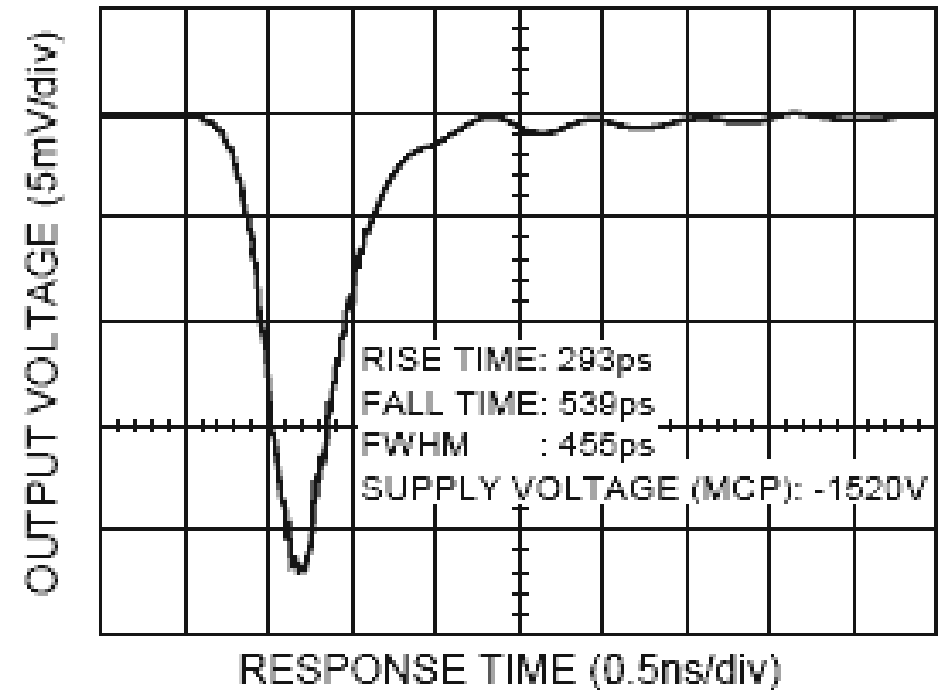
A. Drozd, G. Feofilov, N. Kalinichenko, N. Makarov,
F. Valiev, A. Yafyasov

MCP

A microchannel plate is a slab made from highly resistive material with a regular array of tiny tubes, densely distributed over the whole surface.

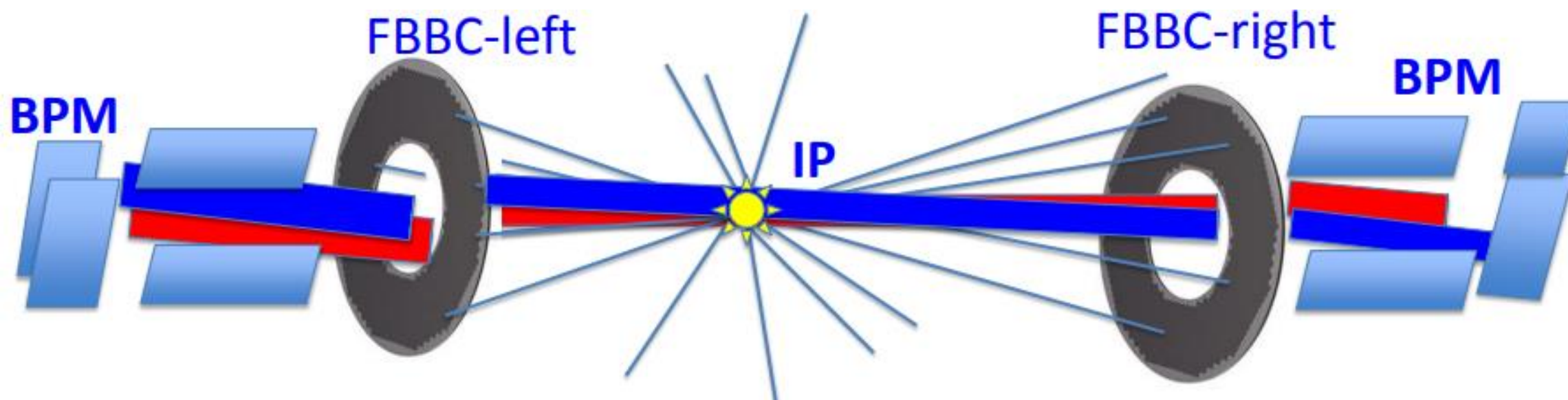


MCP design



Output signal at the HAMAMATSU MCP designed for time-of-flight measurements

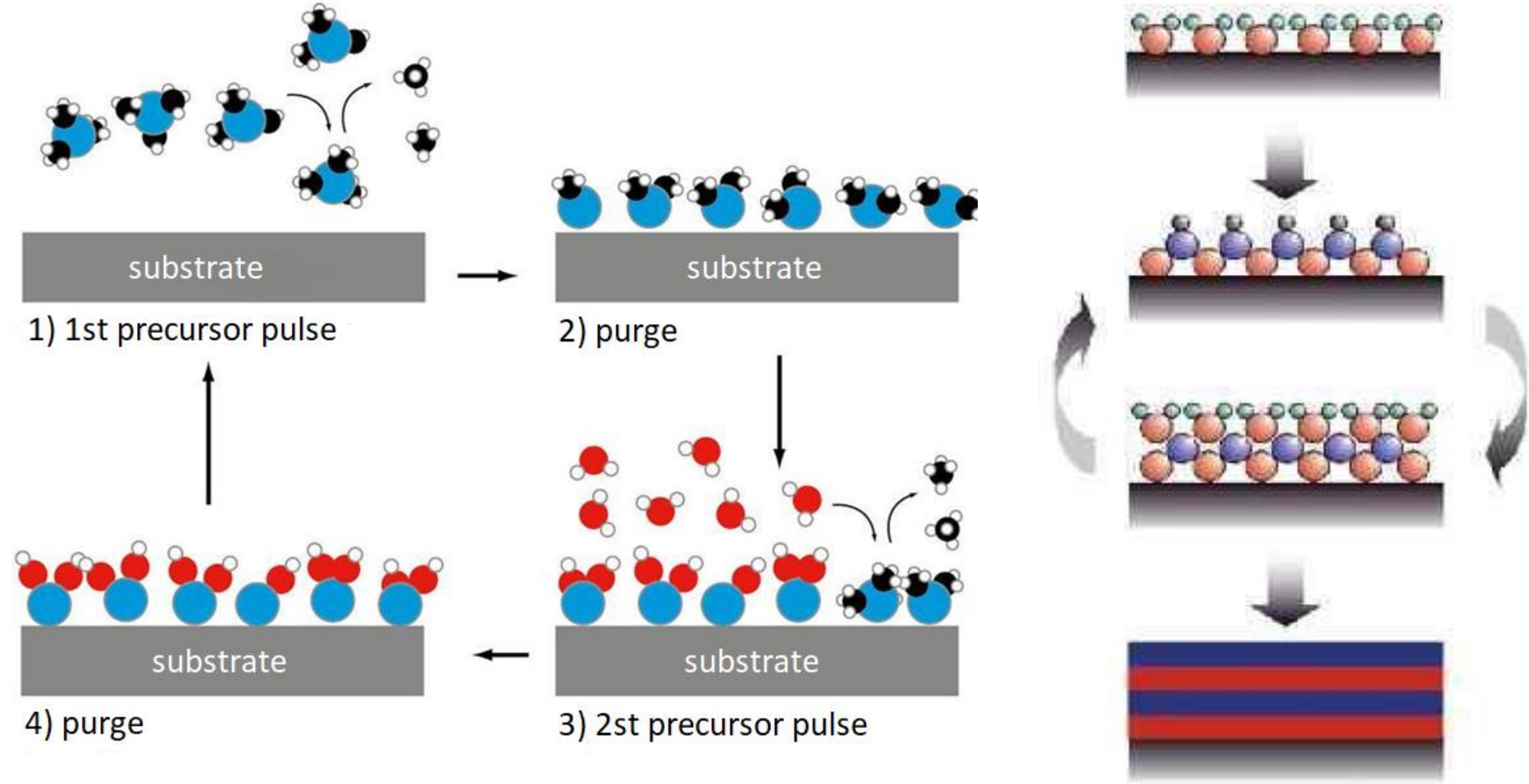
Fast Beam-Beam Collisions Monitor



FBBC - Fast Beam-Beam Collision

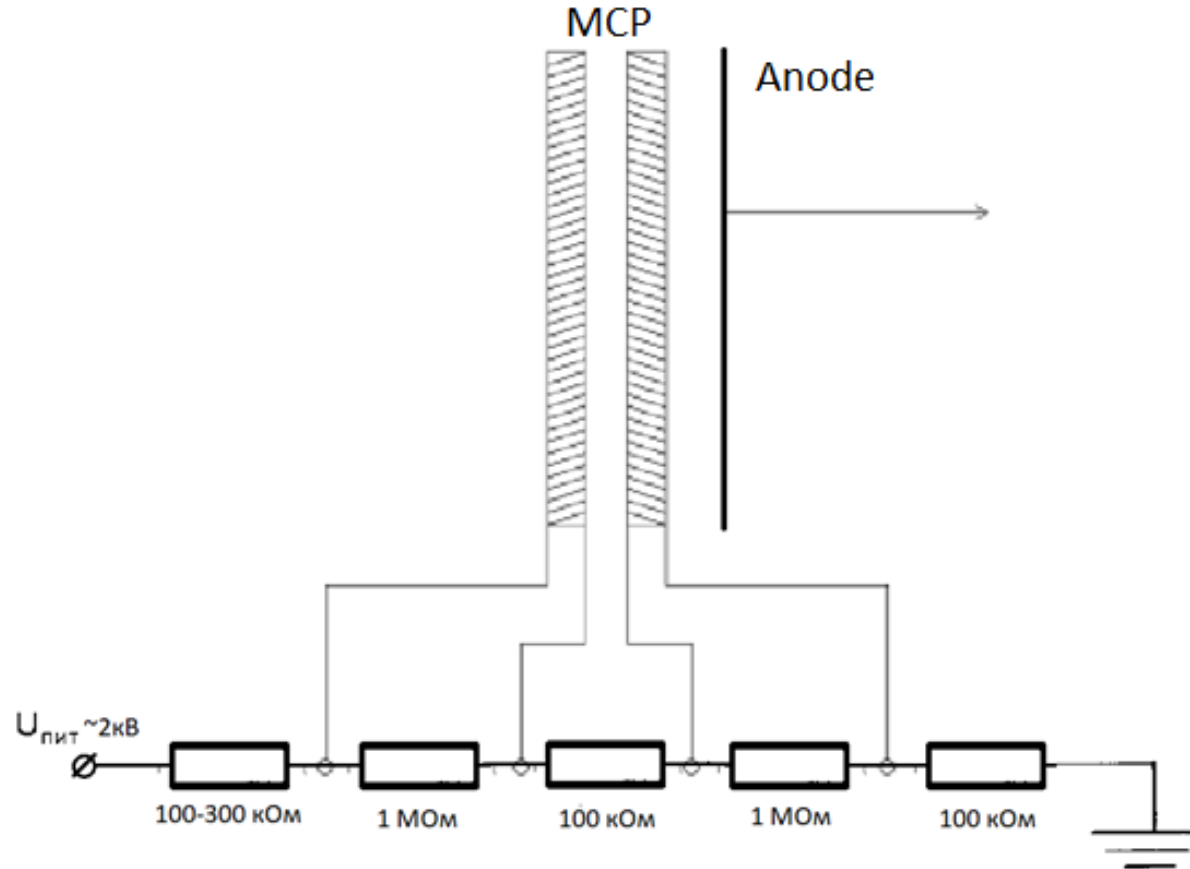
BPM - Beam Position Monitor

Atomic Layer Deposition (ALD)

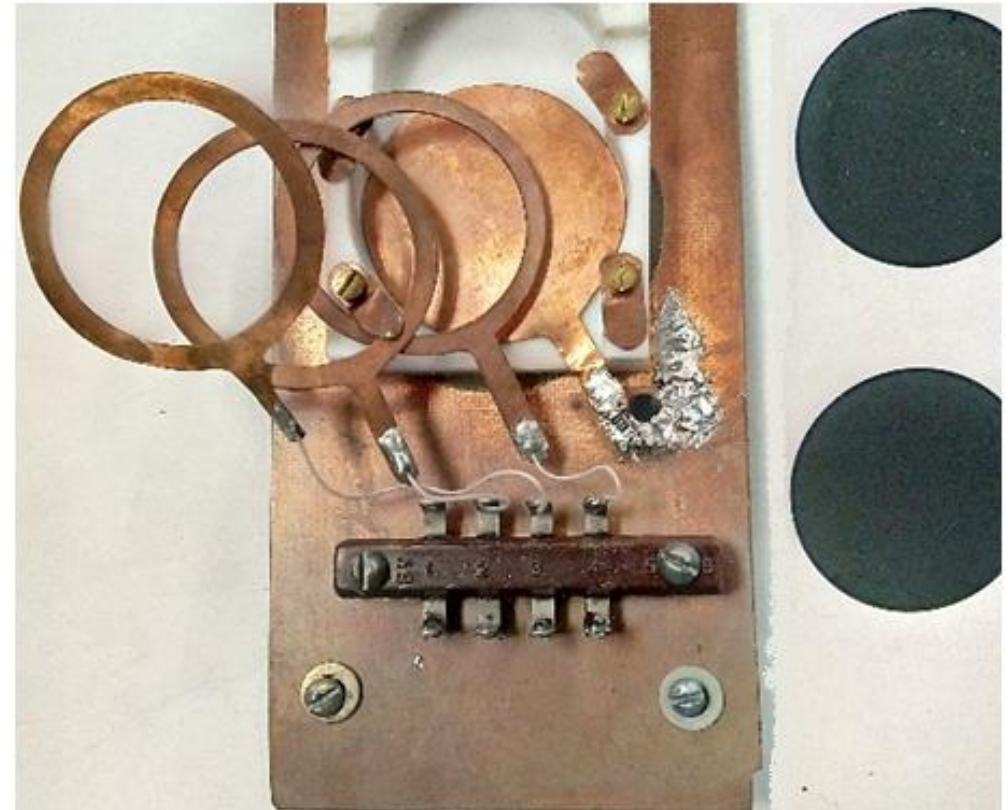


Detector design

Assembled detectors consist of a voltage divider and two MCP sequences



Detector scheme

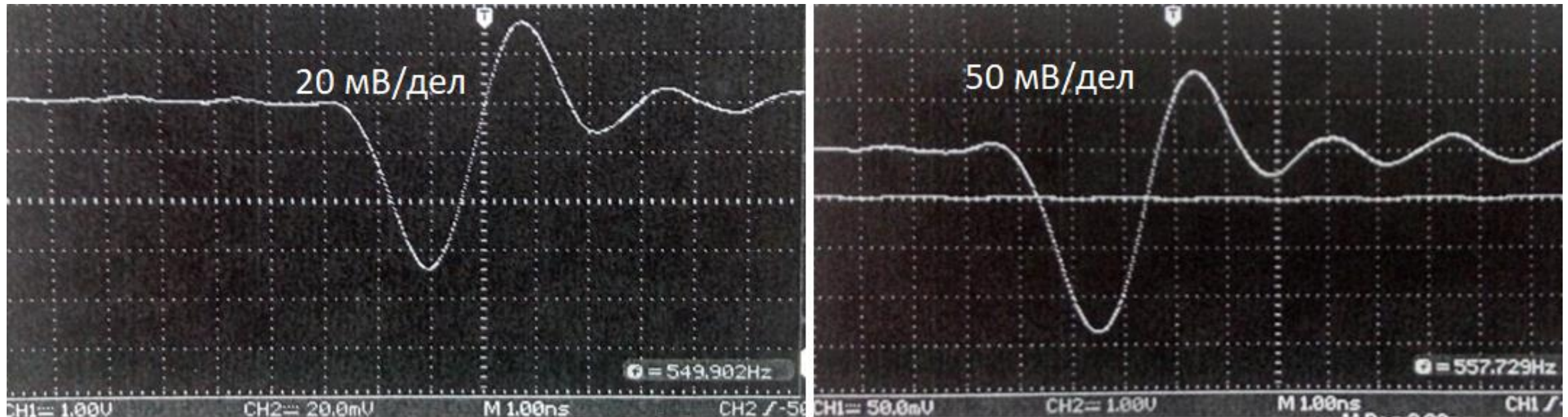


Device detector

Deposited Al_2O_3

MCPs were coated with an Al_2O_3 layer by ALD.

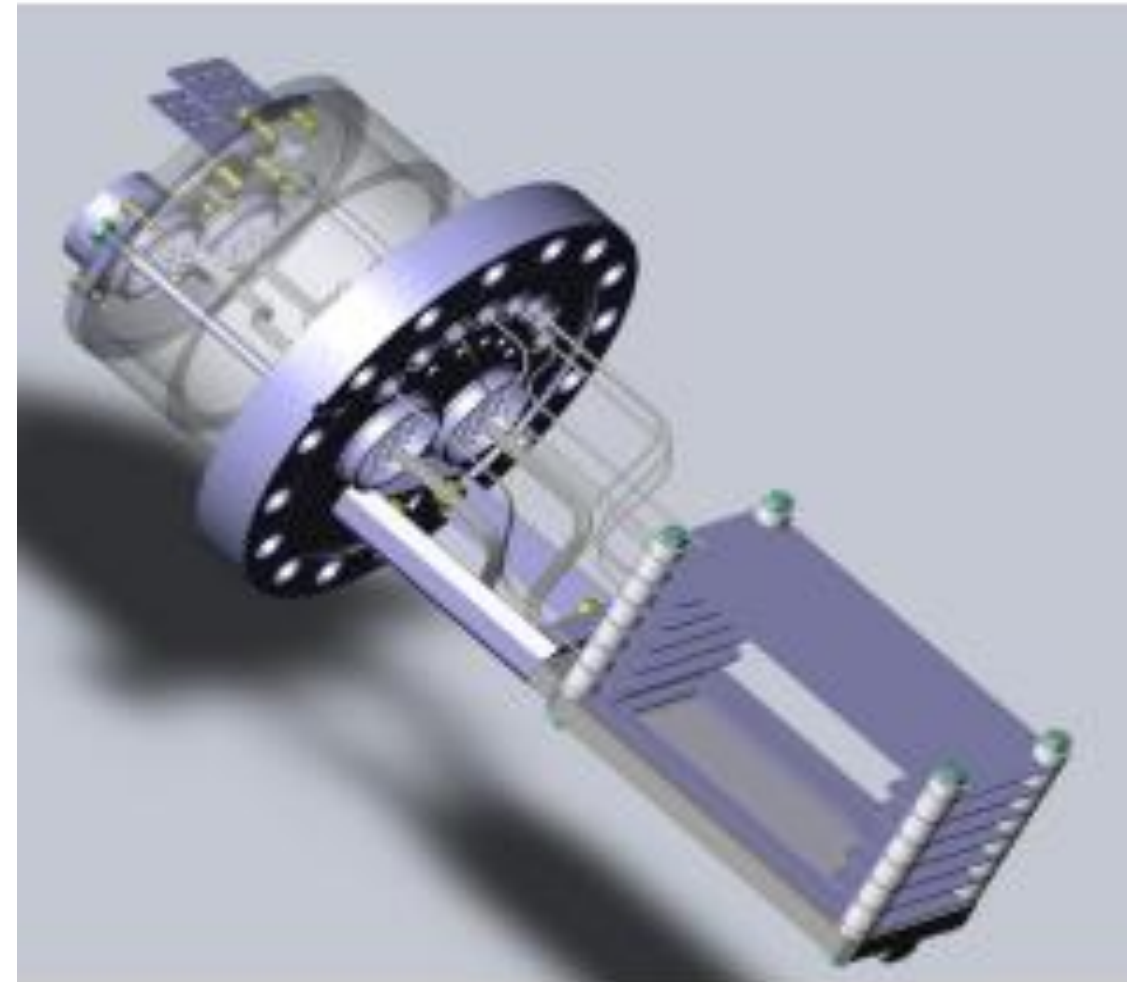
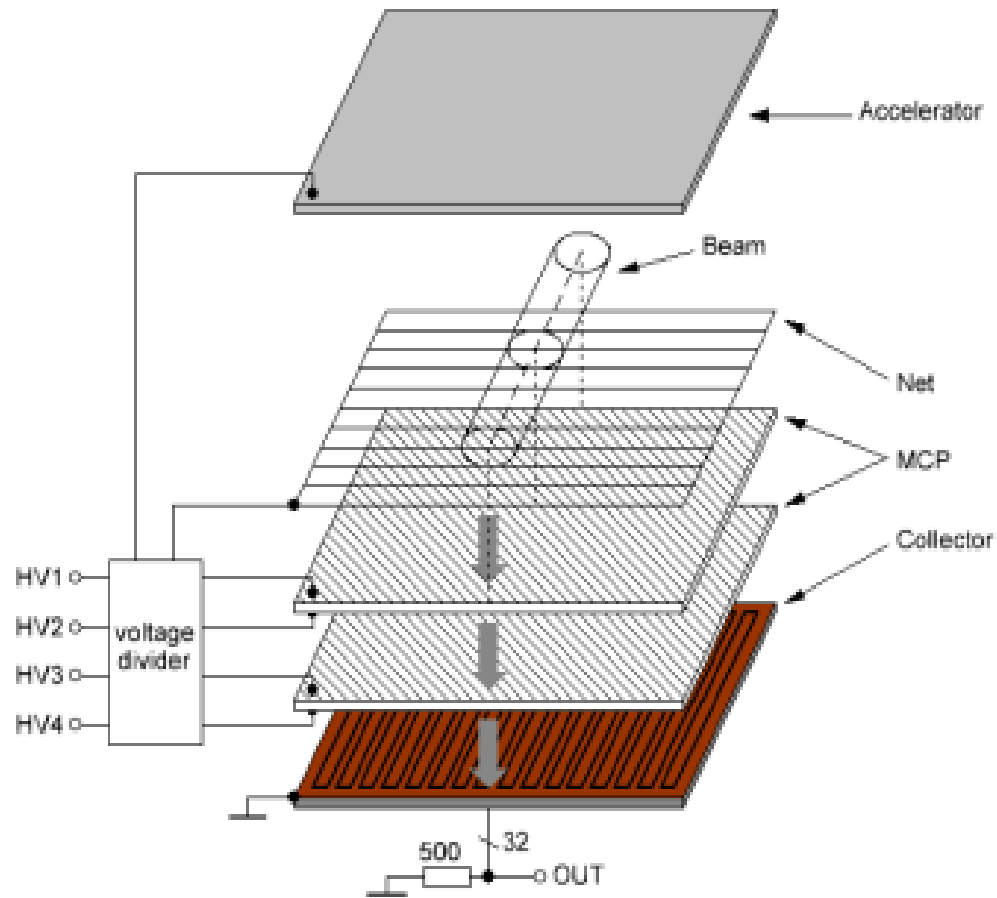
After the deposition of a 30 nm Al_2O_3 layer, the signal amplitude increased by a factor of 1.5, for films with a thickness of 10 nm, by 2.5.



Signal from the detector before deposition of Al_2O_3 with a thickness of 10 nm (20 mV / div) and after (50 mV / div).

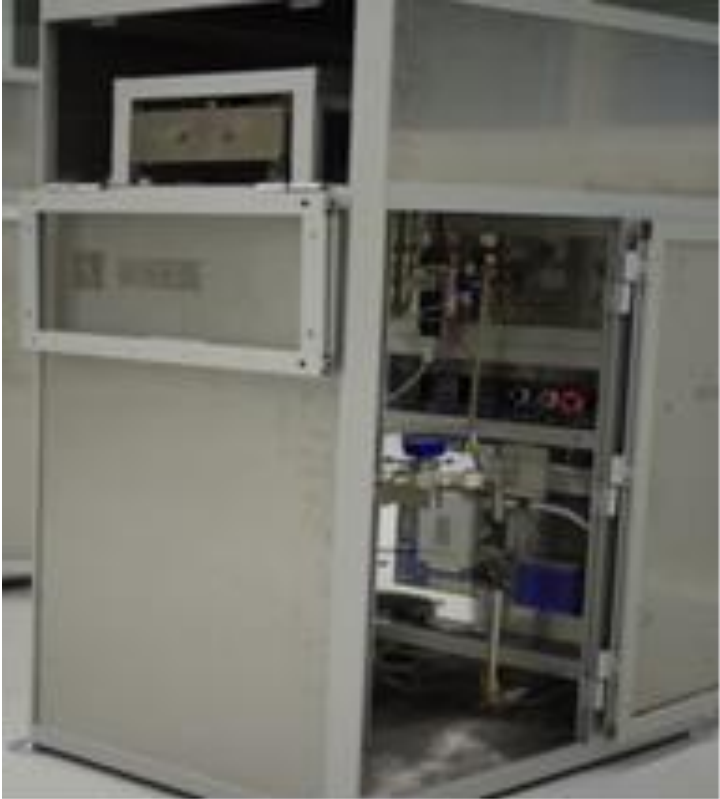
Thank you for attention

Beam Position Monitor

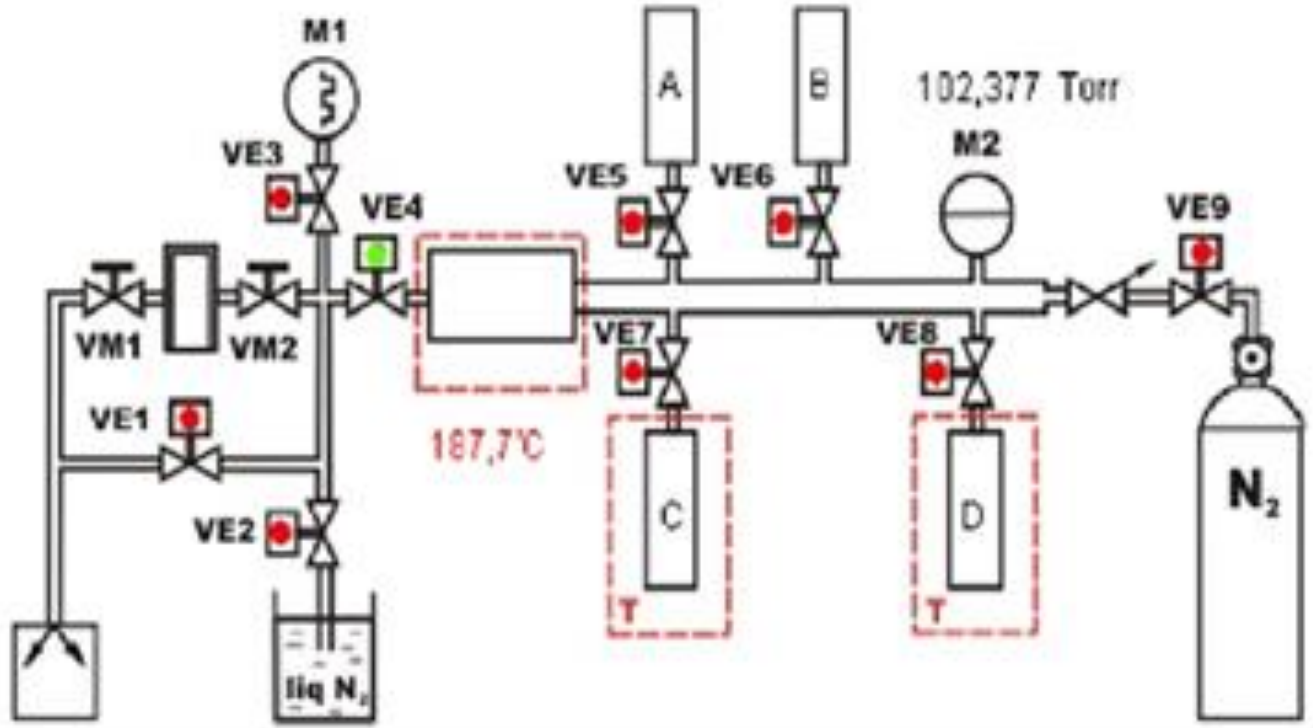


A.Baldin, A.Berlev, I.Kudashkin, A.Fedorov, Space-time characteristics of the circulating beams, Letters to ECHAIA, 2014, vol.11, №2 (186), p.209-218

Atomic Layer Deposition



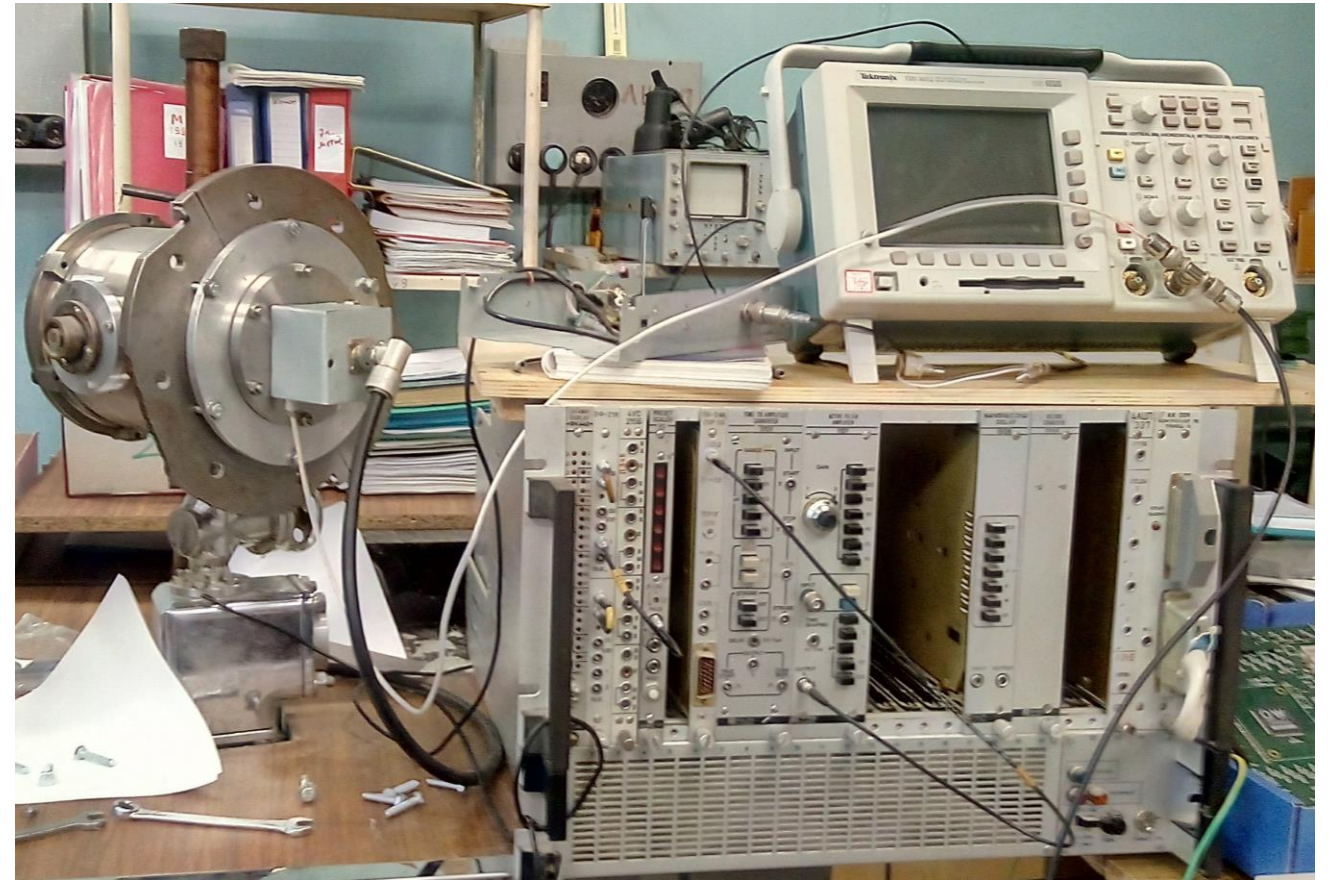
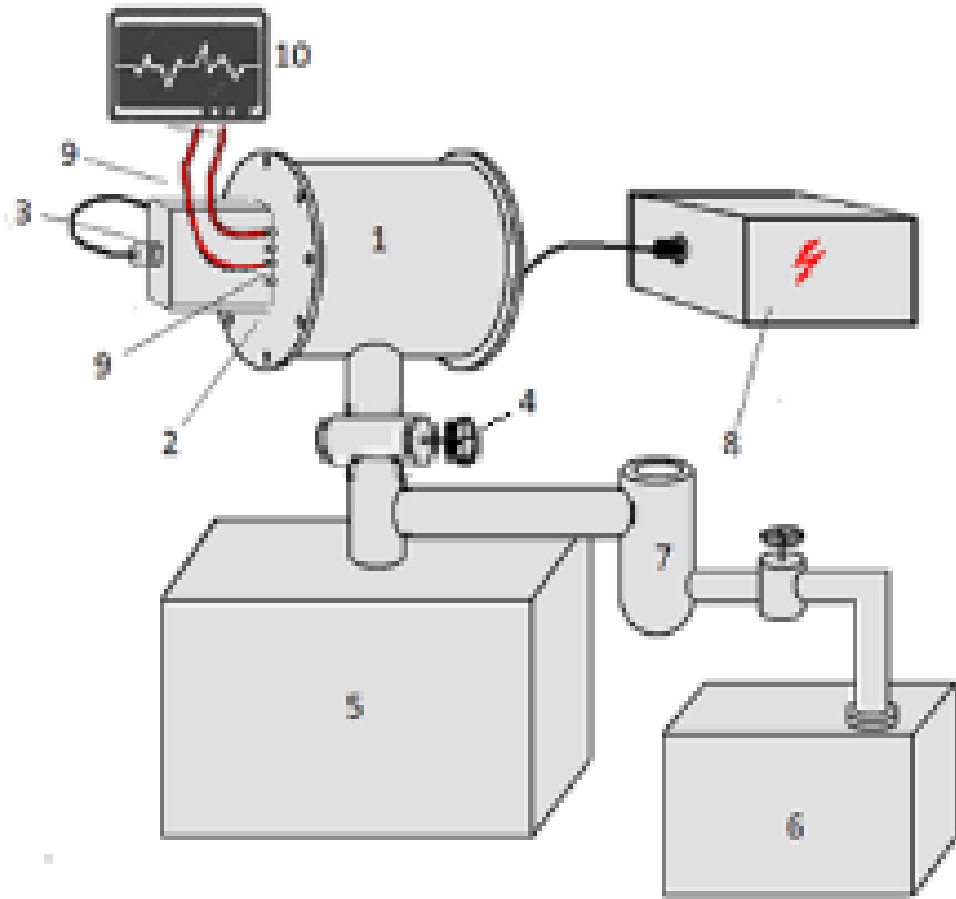
Device "Nanoserf"



Facility scheme

Arsenii Drozd, Adil Yafyasov, Victor Drozd. «Atomic layer deposition method to control the properties of microchannel plates»

Vacuum chamber



Added matching chain

