Triple-stack Multigap Resistive Plate Chamber with Strip Readout

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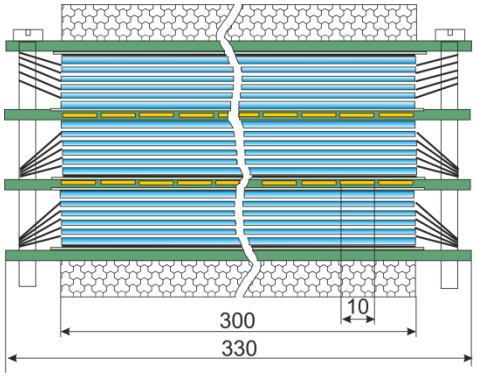
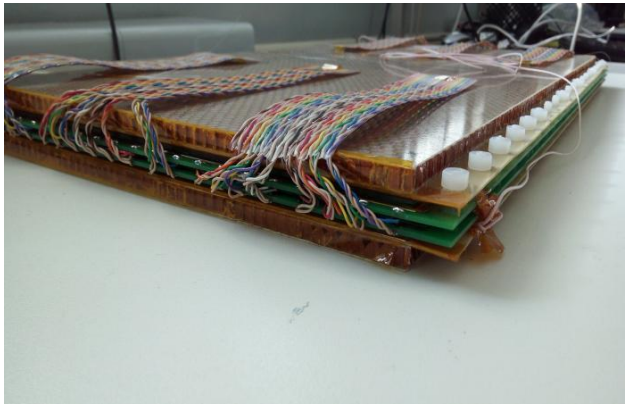
New full-scale MRPC proposed for time-of-flight system of the BM@N and the MPD experiments. The prototype was produced and tested. First time we use three stacks of glasses to make symmetrical construction to decrease dispersion and reflections of the signal on the long readout strip.

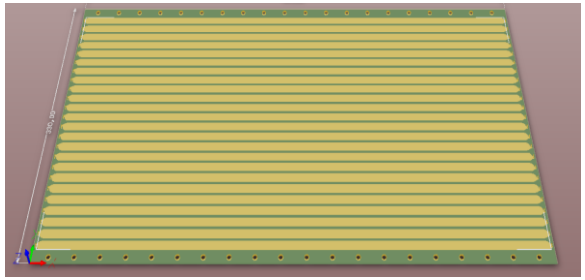


Scheme of triple-stack MRPC

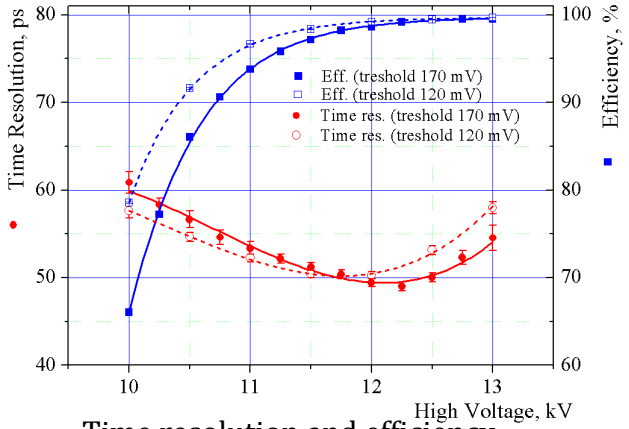
MRPC prototype characteristics:	
Active surface	600x300 mm^2
Dimensions of strips	600x10 mm^2
Channel number	24
Glass thickness (inner, outer)	280 μm 400 μm
Number of stacks	3
Gap number (in 1 stack)	5
Gap width	200 μm



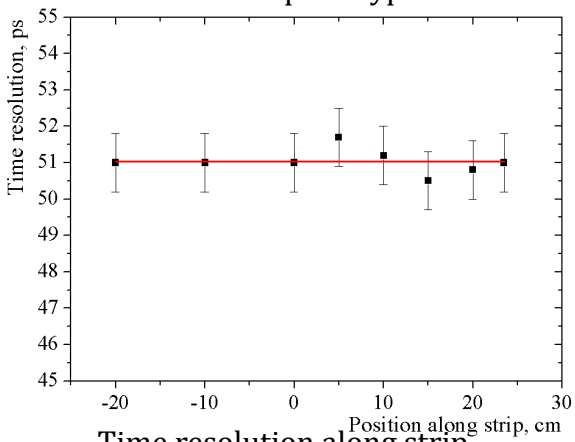
Assembled prototype



PCB with readout strips



Time resolution and efficiency



Time resolution along strip.

Preliminary test results for the one strip of the triple-stack MRPC prototype are presented. Time resolution achieves of 50 ps at the voltage of 12 kV with efficiency better than 99%. A further increase in voltage causes an increase of the number of streamers and to deterioration in time resolution. Influence of the threshold of discrimination on the resolution and efficiency is not significant. The time resolution of the detector does not change due the position of the particles tracks along the strip.