

Test of the LHCb Muon chamber on the GIF⁺⁺

(current planing)

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Chamber test setup in the GIF++



Currently we have installed the chamber support on the up-stream position. Initially we installed our standard chamber M1R3.

Now we would like to start our measurement to understand if we are happy with our setup, or we need to improve it.

Actually we would like to perform the test with the high granularity chamber. The prototype of the chamber is already made, but not delivered.

Chamber under test

For beginning we would like to use chamber M1pads readout chamber

Chamber pad geometry - 48 x 2 (Fig. 1)

Pad size 20 x 100 mm²

Active area 1000 x 200 mm²

Chamber size -1200x300mm²

Gap 2 x 2.5 mm

Wire pitch 2 mm

Wire diameter 30μm

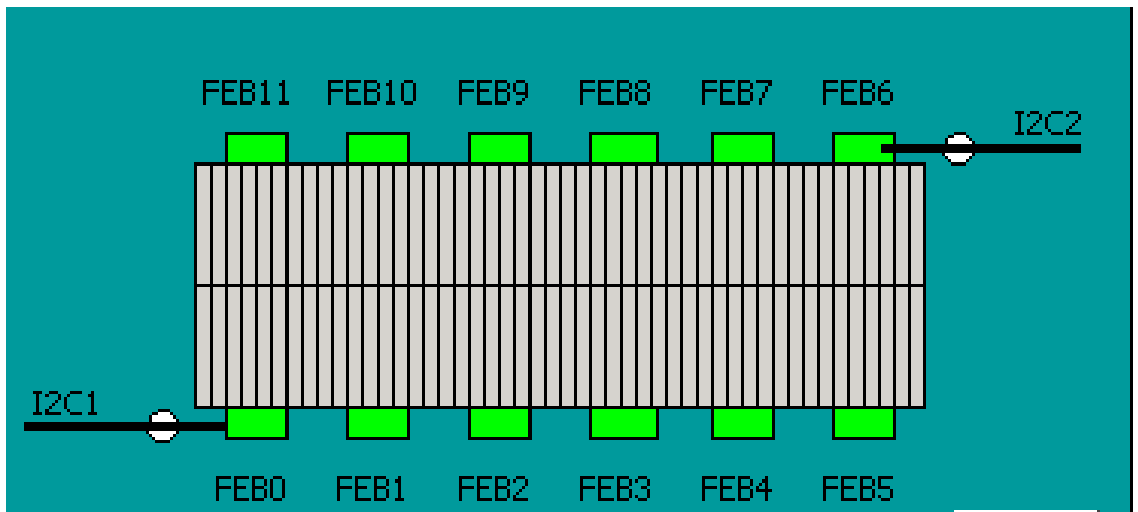


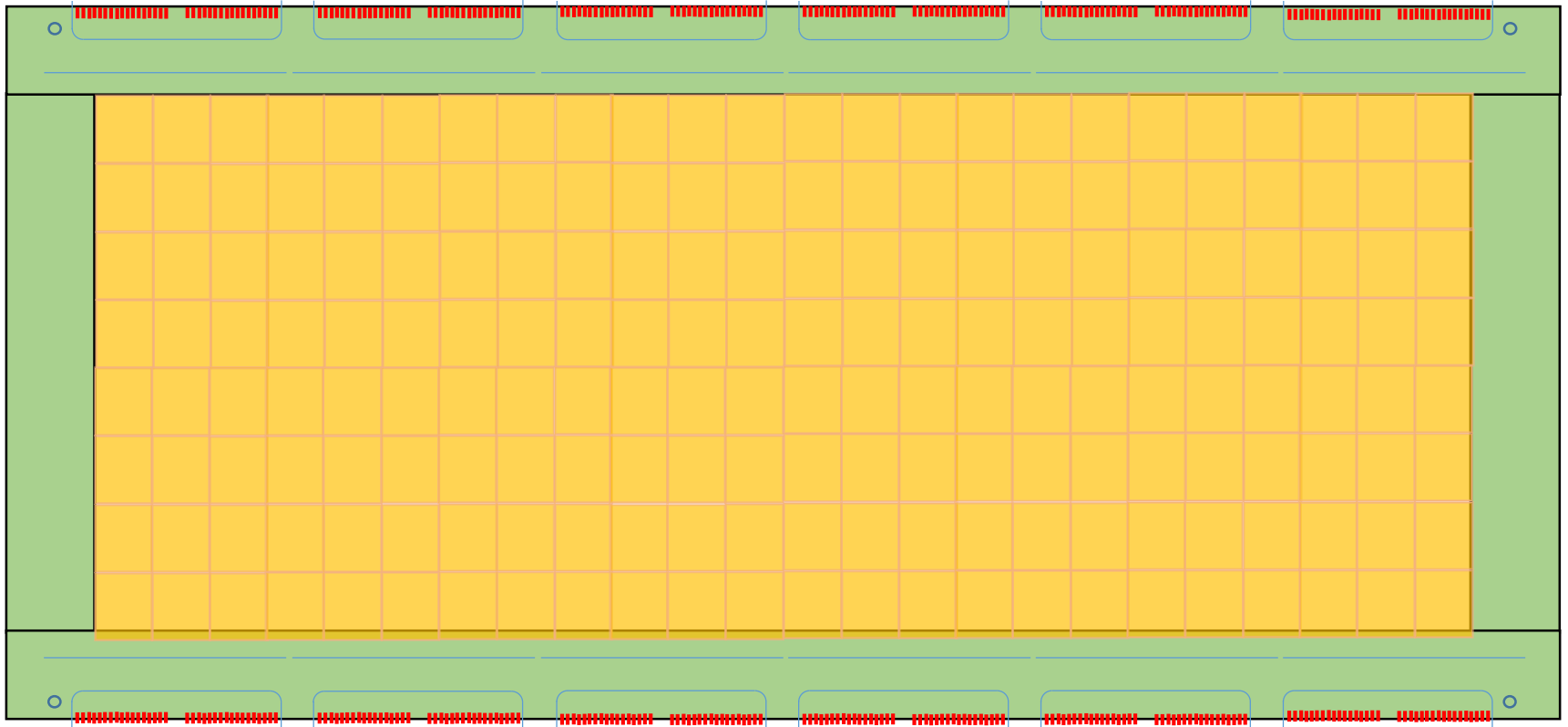
Fig 1. Pad structure of the chamber M1R3

Chamber proposed for test.

Cathode pad readout chamber

Pad structure - 24x8, pad size - 25mm x 30mm

total -192 readout channels



The main task.

LHCb chambers of internal regions are working with 90% of secondary particles. Most of them γ -particles.

Till now it was not very significant, but with increasing beam luminosity this effect becoming very important.

The main task of our test is to estimate the registration efficiency of the muons with high rate of incoming particles (more than 1MHz per channel), when the rate of uncorrelated (parasitic) particles at least in 10 times more than the rate of correlated particles.

Measurement plan

1. Switch on the chamber and insure that the chamber is in good condition, if necessary we need to train it.

2. Measure the chamber rate versus the distance to the source.

The γ - rate versus distance $E=E_0 /R^2$. If we know the real γ - rate and we have the same function of our measurement – we can estimate the γ conversion factor and the efficiency of the registration the γ particles by our chamber.

3. Measure the efficiency of the beam particles (muon) versus the intensity of the γ -particles.

4. If it is interesting for the community, we can measure the chamber counting inside the irradiating area to estimate the γ -particles conversion