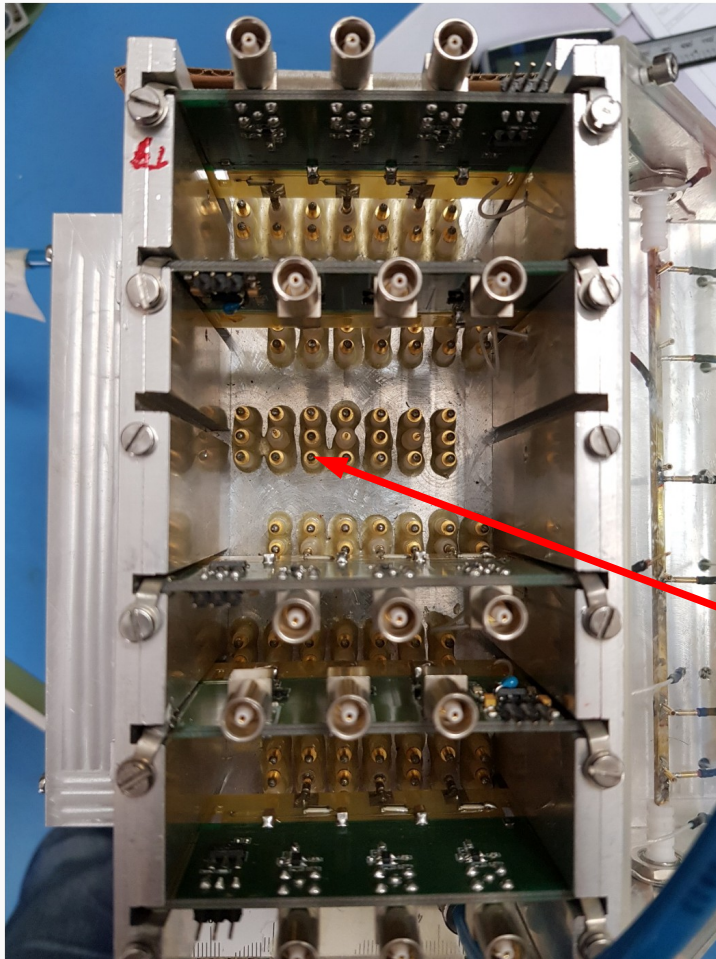# Beam Monitor update

Milano + Trento

FOOT performance meeting
05/02/20

Outlook

- Channel lost

- Performances for 2020 GSI run

- GSI (electronic) data: BM-VTX

- To do list

Channel lost

- In 12/2019 we tried to test the BM stand alone acquisition chain.

- The pins of the low voltage has been plugged in the wrong way (we naively believed what was written on the board).

- This caused the damage of the capacitors of the LW board used in the voltage stabilizer circuit.

- In the substitution of the capacitors, one sense wire of a cell has been broken.

Channel lost (2)

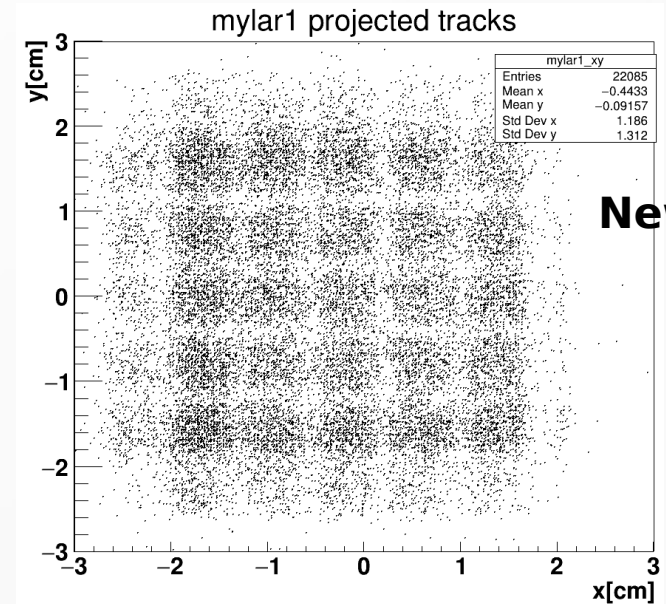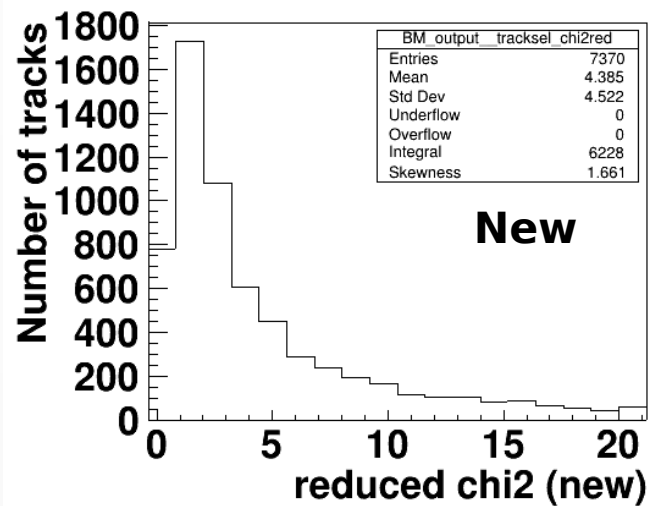Cell occupancy for raw hits

BM_output__raw_occupancy
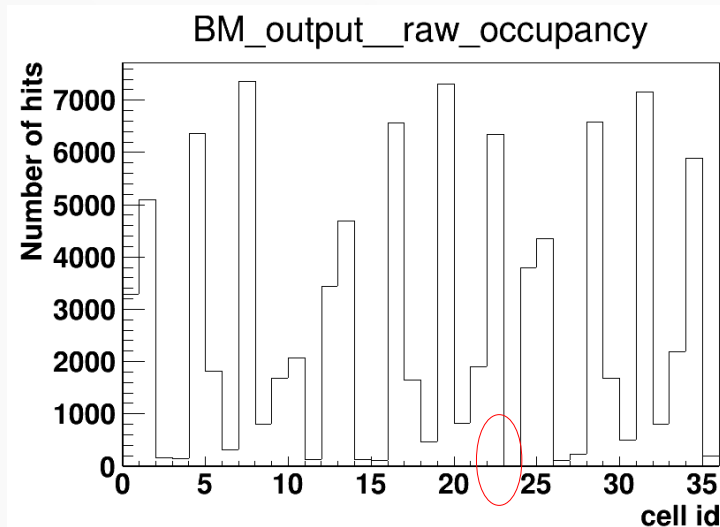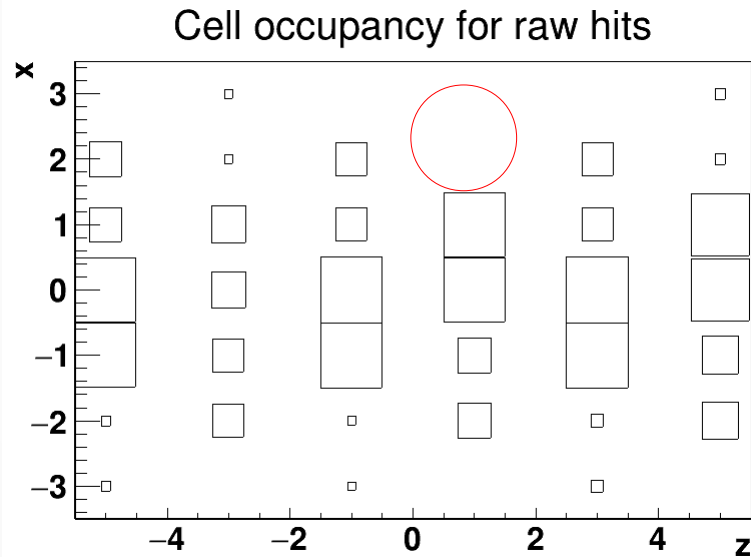
- The channel lost is a side cell with the wire parallel to the y direction (gives the x meas.)

- The broken sense wire has been extracted and after different tests, apparently no wire residuals seems to be present in the chamber.

- All the other channels are not damaged and the capacitors have been substituted without difficulties.

- We tested the BM @ Trento with Proton beam to check its performances.

- Comparing with the old tests, we do not see great differences.

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Performances for 2020 GSI run
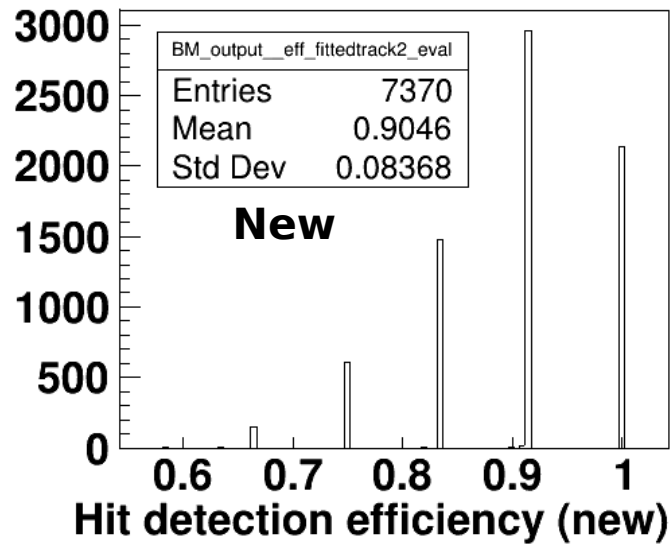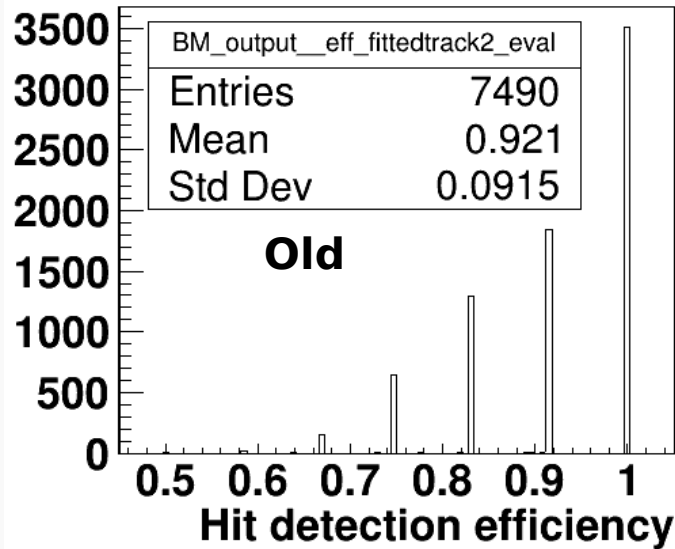
- The hit detection efficiency is similar to the past: all the other cells are working good
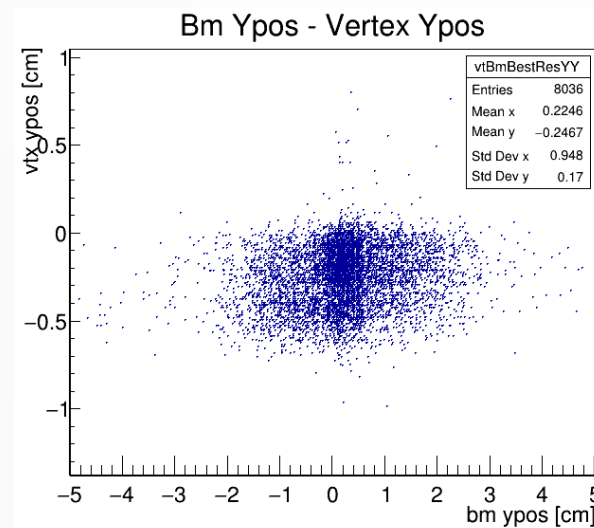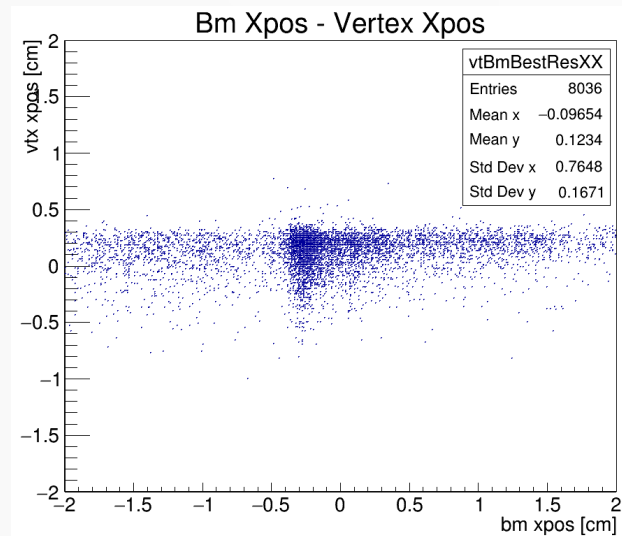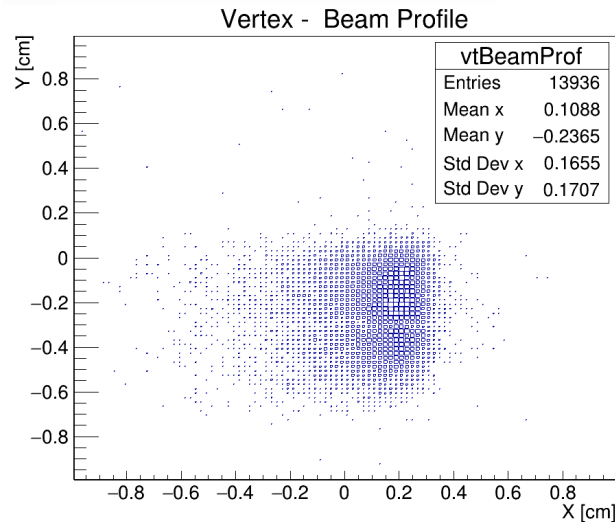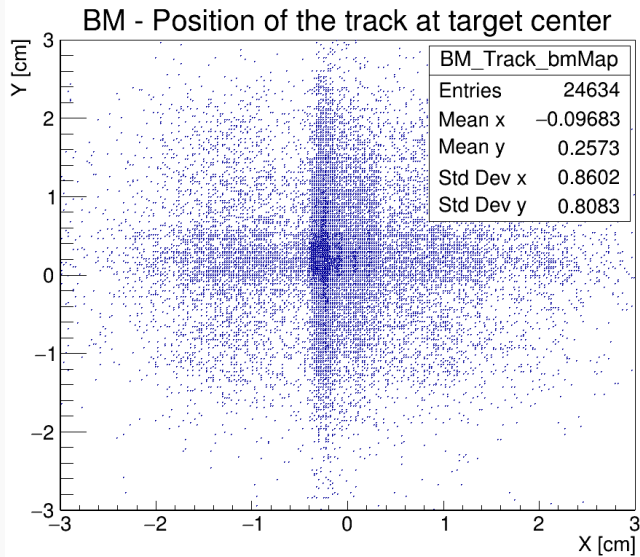
- The track reconstruction does not seems to be affected by the dead cell

- With the software improvements, we will reconstruct better than the last year

- Even with a spread beam, apparently there isn't any hole in the track reco.

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GSI electronic setup: BM-VTX

BM - Position of the track at target center

BM_Track_bmMap	
Entries	24634
Mean x	−0.09683
Mean y	0.2573
Std Dev x	0.8602
Std Dev y	0.8083

Vertex - Beam Profile

vtBeamProf	
Entries	13936
Mean x	0.1088
Mean y	−0.2365
Std Dev x	0.1655
Std Dev y	0.1707

Bm Xpos - Vertex Xpos

vtBmBestResXX	
Entries	8036
Mean x	−0.09654
Mean y	0.1234
Std Dev x	0.7648
Std Dev y	0.1671

Bm Ypos - Vertex Ypos

vtBmBestResYY	
Entries	8036
Mean x	0.2246
Mean y	−0.2467
Std Dev x	0.948
Std Dev y	0.17

- Starting analysis on the 2211.july.dat run (no target, in principle vtx synchronized)

- BM tracks affected by the T0 shift

- Apparently No BM-VTX correlation

- Possible causes:
  -BM reco suffers too much for the T0 shift
  -VTX reco has something wrong
  -VTX events not synchronized due to event builder or hardware prob.

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To do list

Till the end of February – begin of March

- GSI emulsion data taking (9/2 - 13/2)

- Finalize the BM multi-track reconstruction algorithm (end of February)

- Optimization of the space-time relation autocalibration algorithm

- The software development of the BM should be finalized (except for possible new ideas or requirements)

From March: data analysis

- GSI electronic setup: try to resolve the causes of the BM-VTX loss of correlations (use the TW hits position)

- Check the BM rejecting power on the events in which the projectile has fragmented on the ST or in the BM itself.

- Check the BM resolution and its impact on the inverse kinematic approach.

- ...

Back up

How to add the sense wire
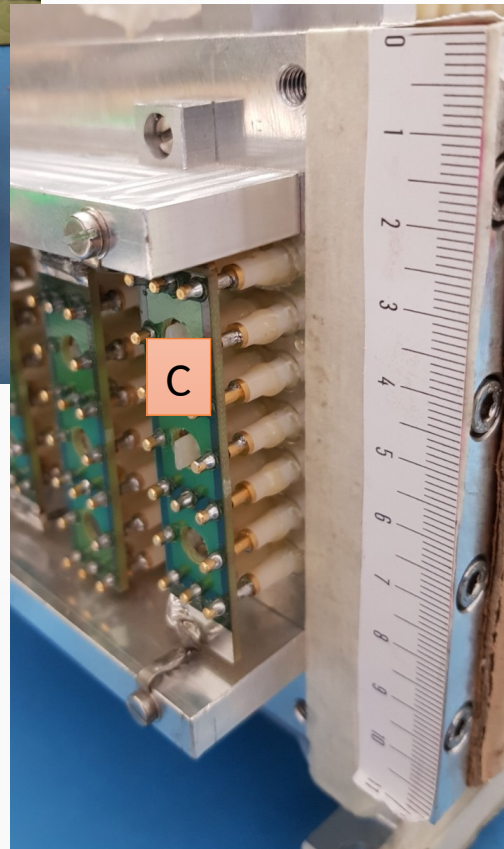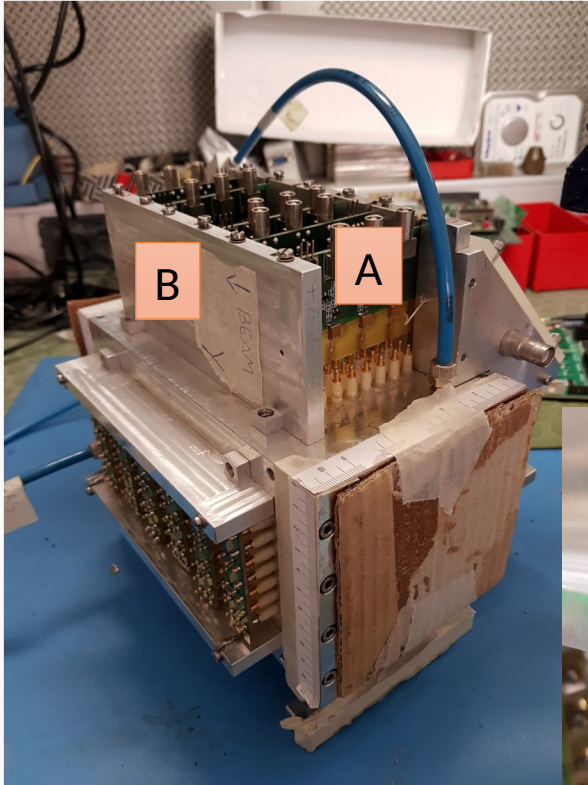
At the moment there no evidence for the need to fix the dead channel.
However if it is needed, the work to do should be the following:

- Remove all the reading boards (A)

- Remove the lateral panel B

- Remove the board (C)→ very critical

- Add a wire inside → very critical

- Glue the wire on on side and pinch it on the other side

- More difficulties due to the fact that who built the BM is retired.