

Magnetic field in decay pipe (simulation vs data)

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Beam sim meeting

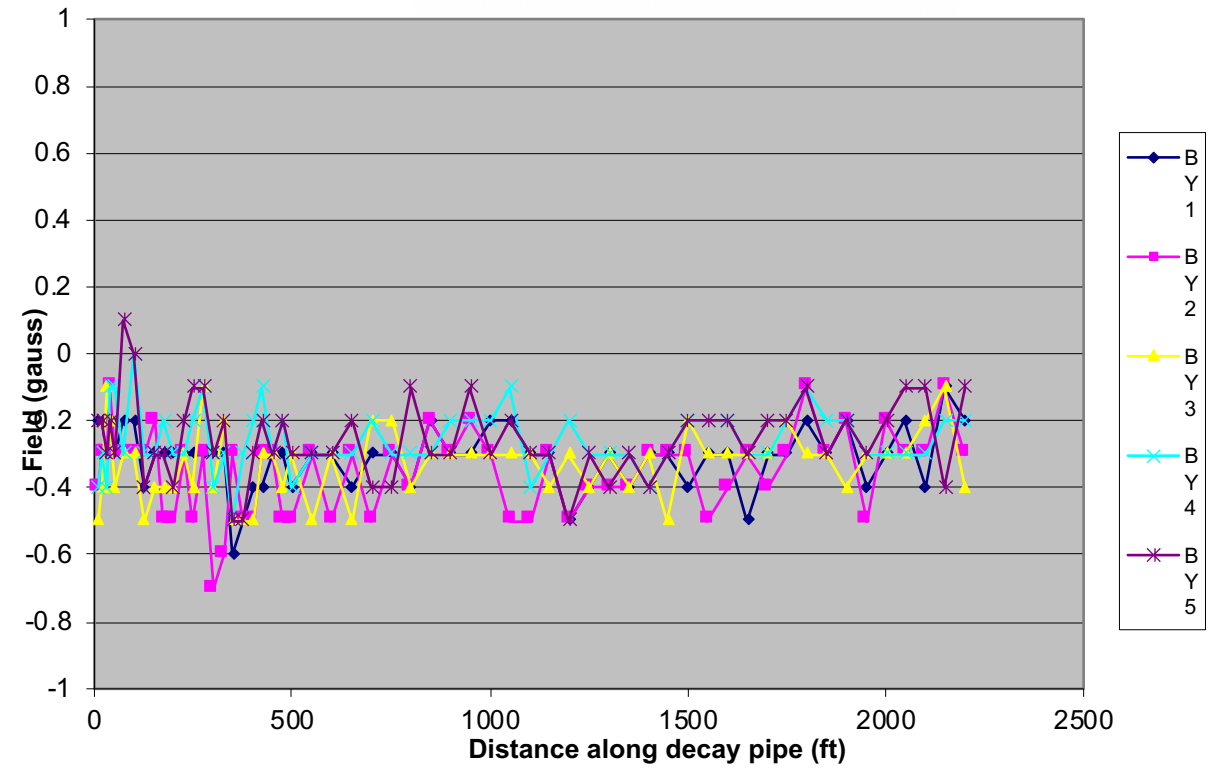
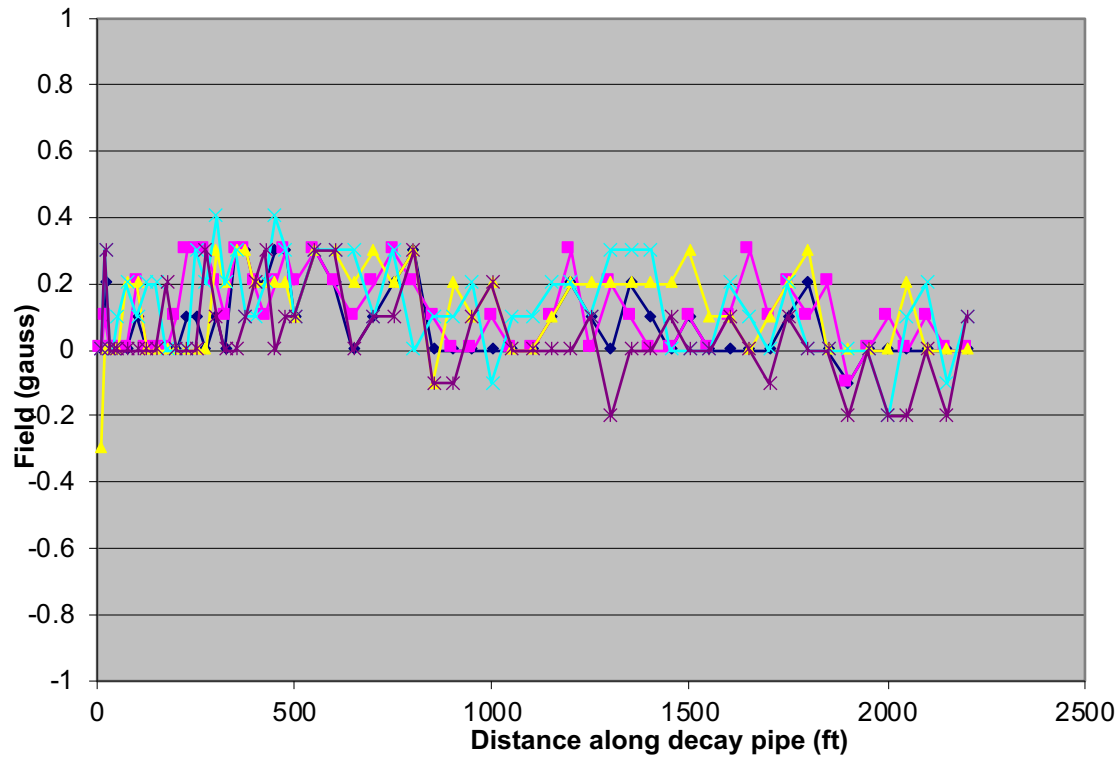
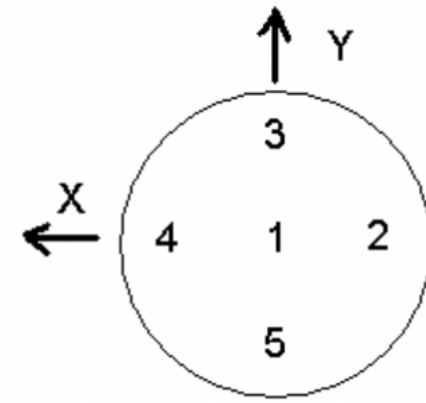
Nov 16, 2022



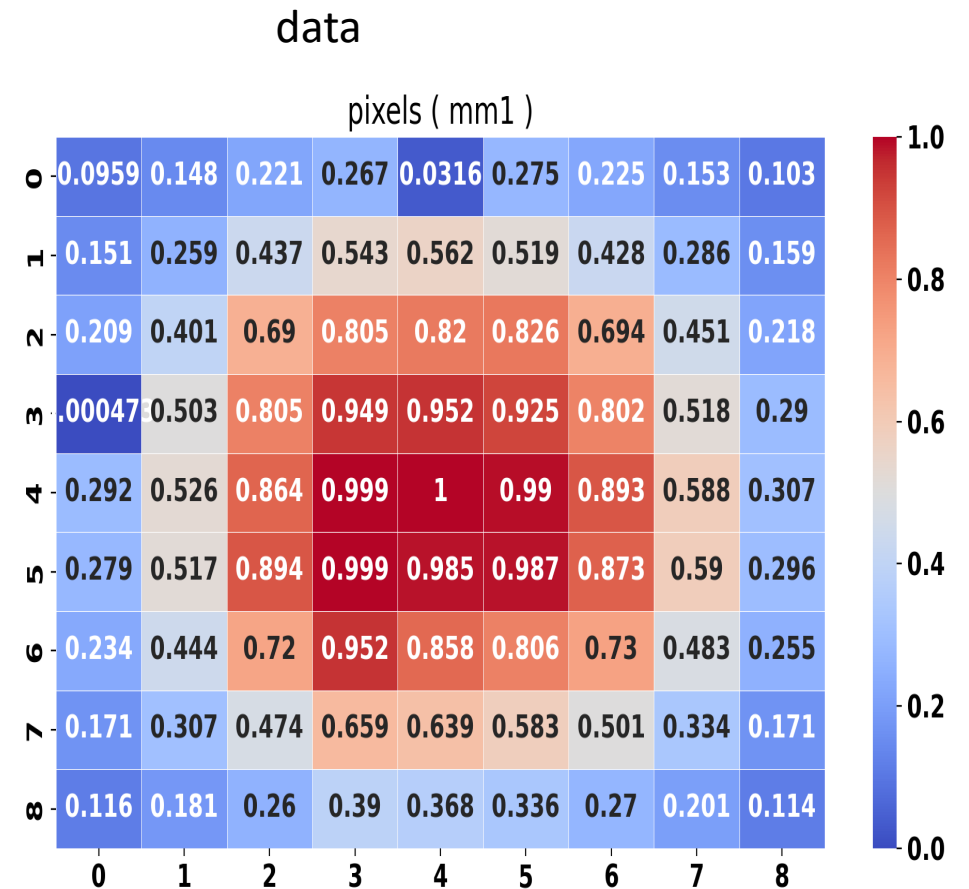
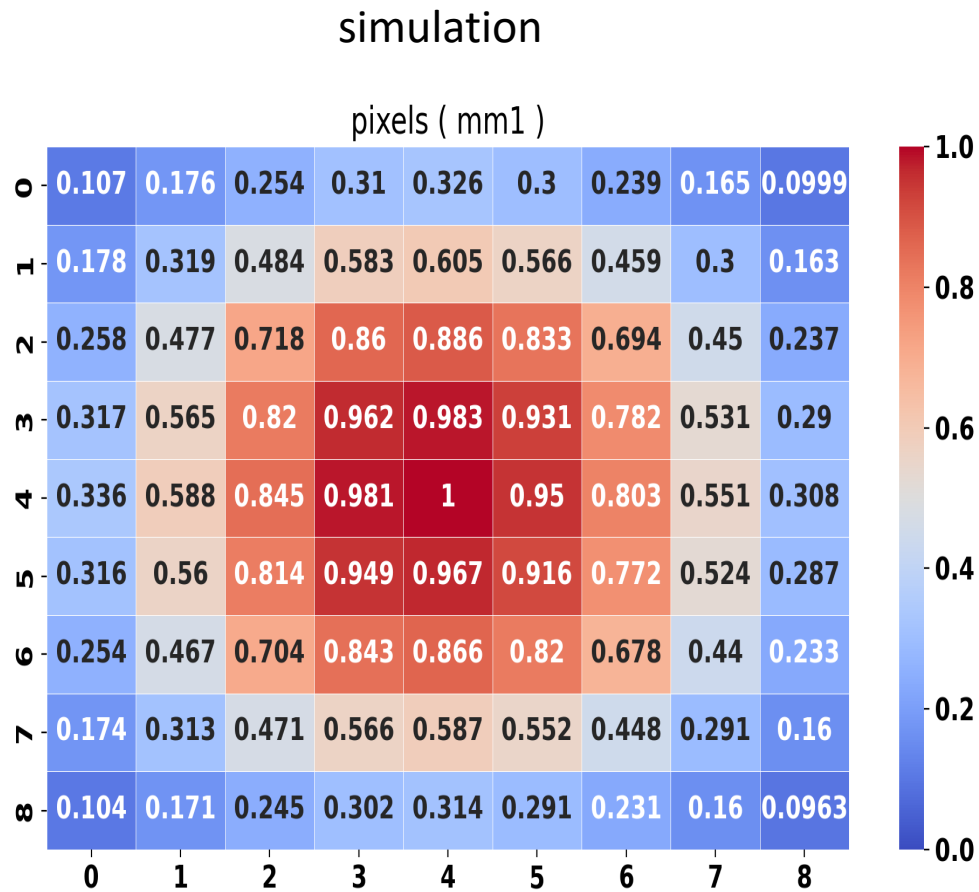
review

Magnetic field in decay pipe measurement

$B_x = 0.1$ Gauss, $B_y = -0.3$ Gauss, $B_z = -0.07$ Gauss



Data vs simulation

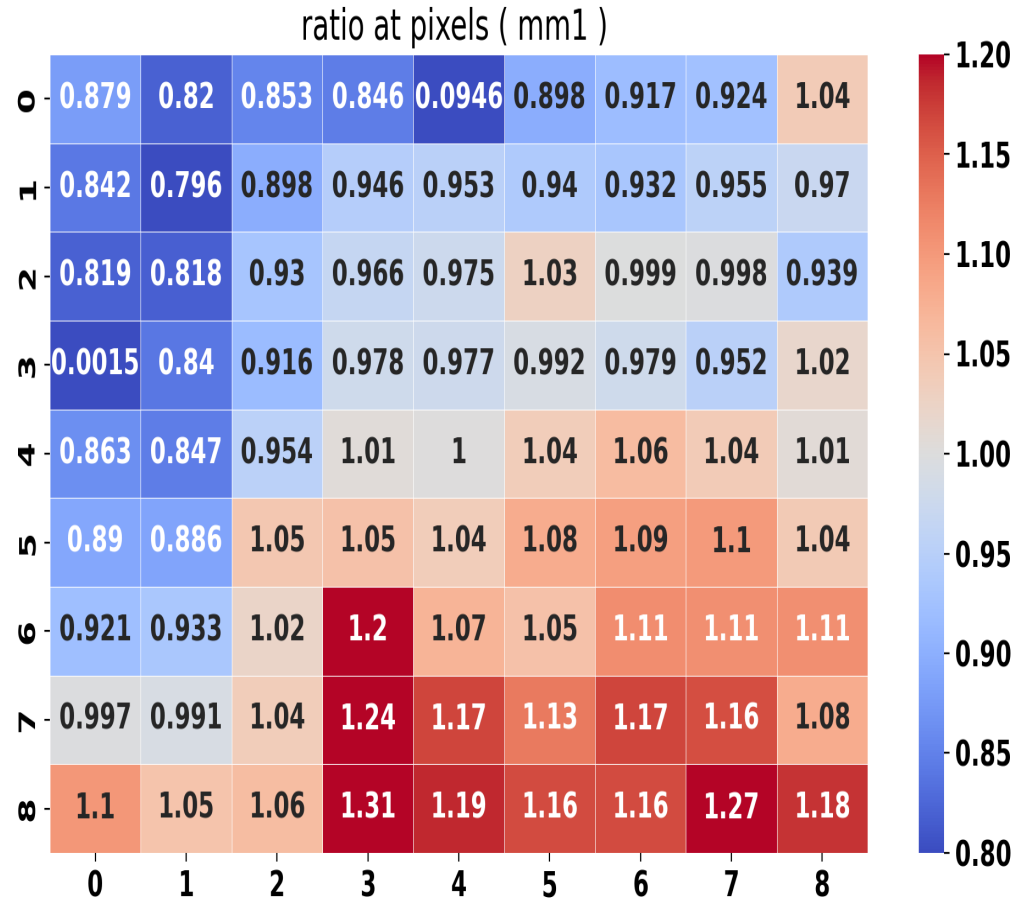


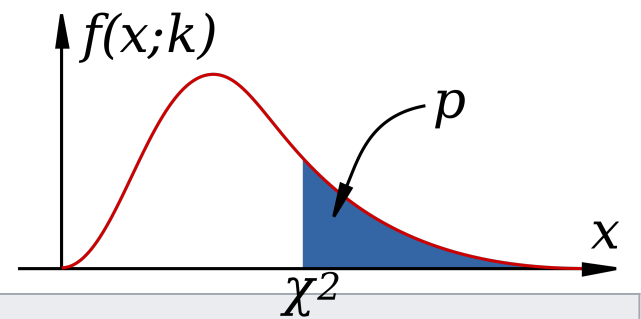
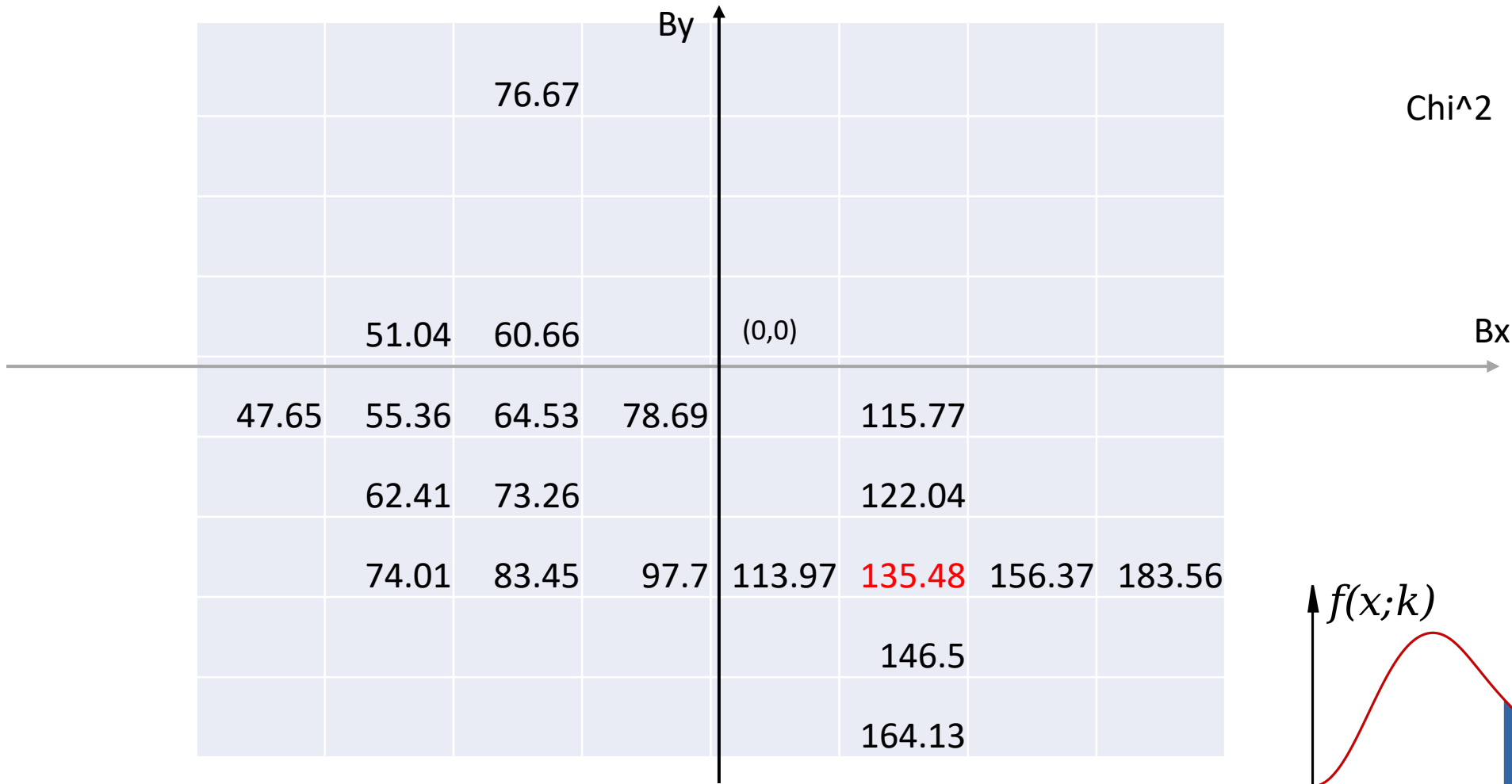
FHC

prediction

$B_x = 0.1$

$B_y = -0.3$





Probability Content, p , between χ^2 and $+\infty$

0.99 5	0.99	0.97 5	0.95	0.9	0.75	0.5	0.25	0.1	0.05	0.02 5	0.01	0.00 5	0.00 2	0.00 1	
38.6	40.6	43.7	46.5	49.9	56.0	63.3	71.2	78.8	83.6	88.0	93.2	96.8	101. 4	104. 7	7

RHC

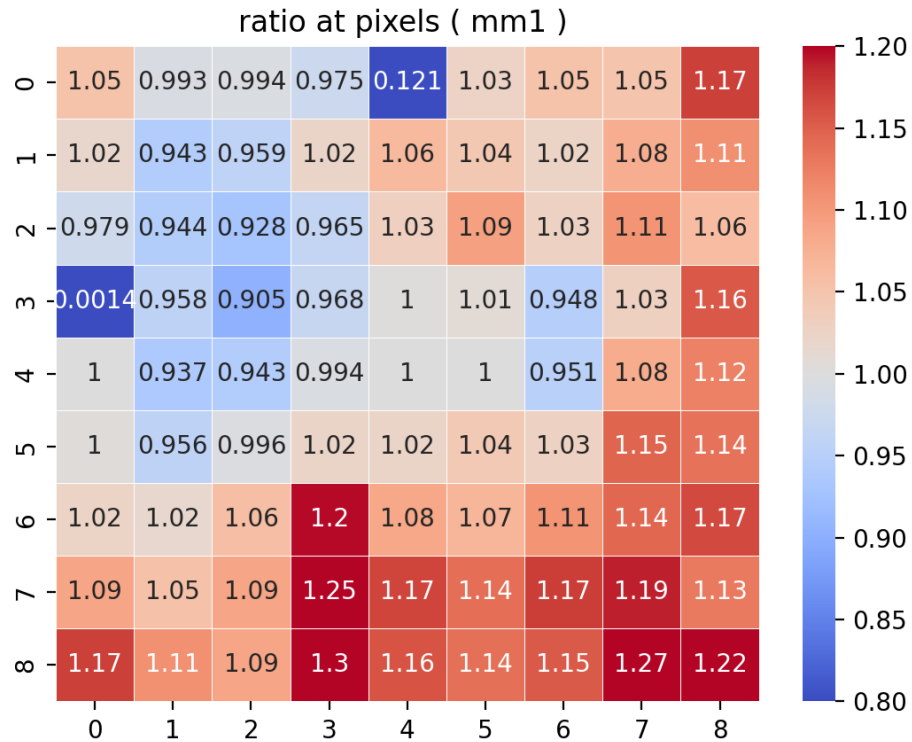
Simulation vs data

Compare sim with data

Ratios = data / sim

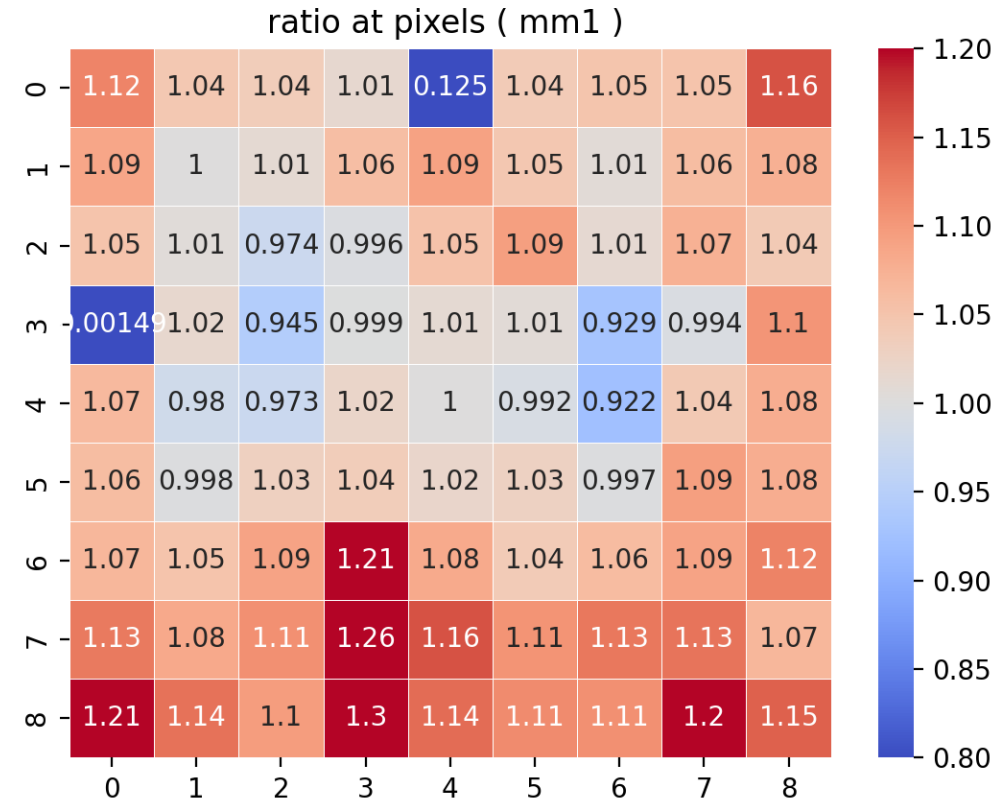
Bx = 0.0

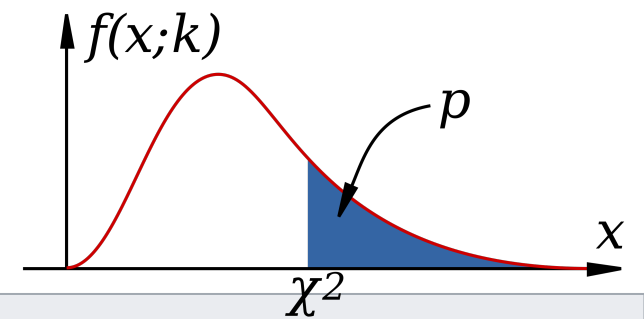
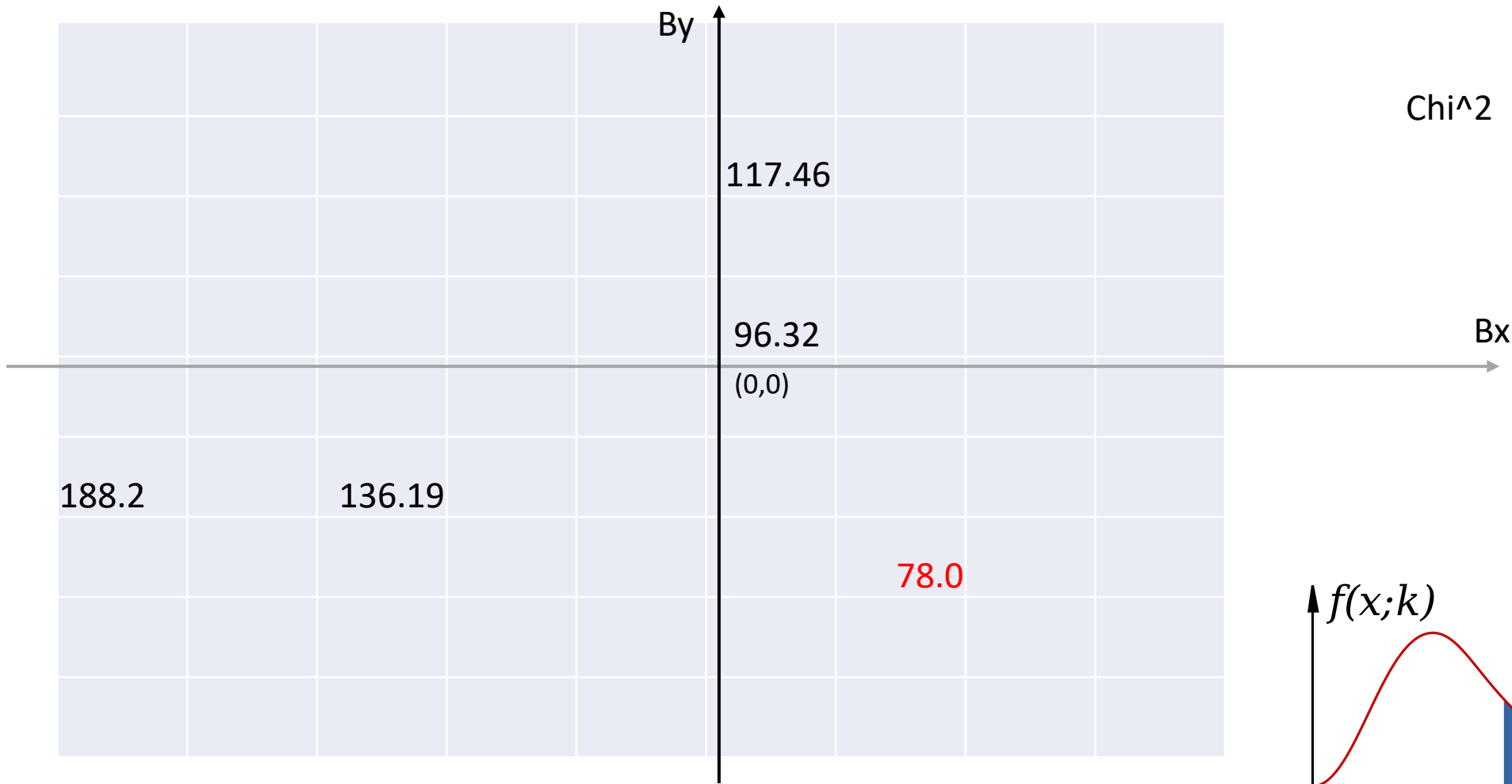
By = 0.0



Bx = 0.1

By = -0.3





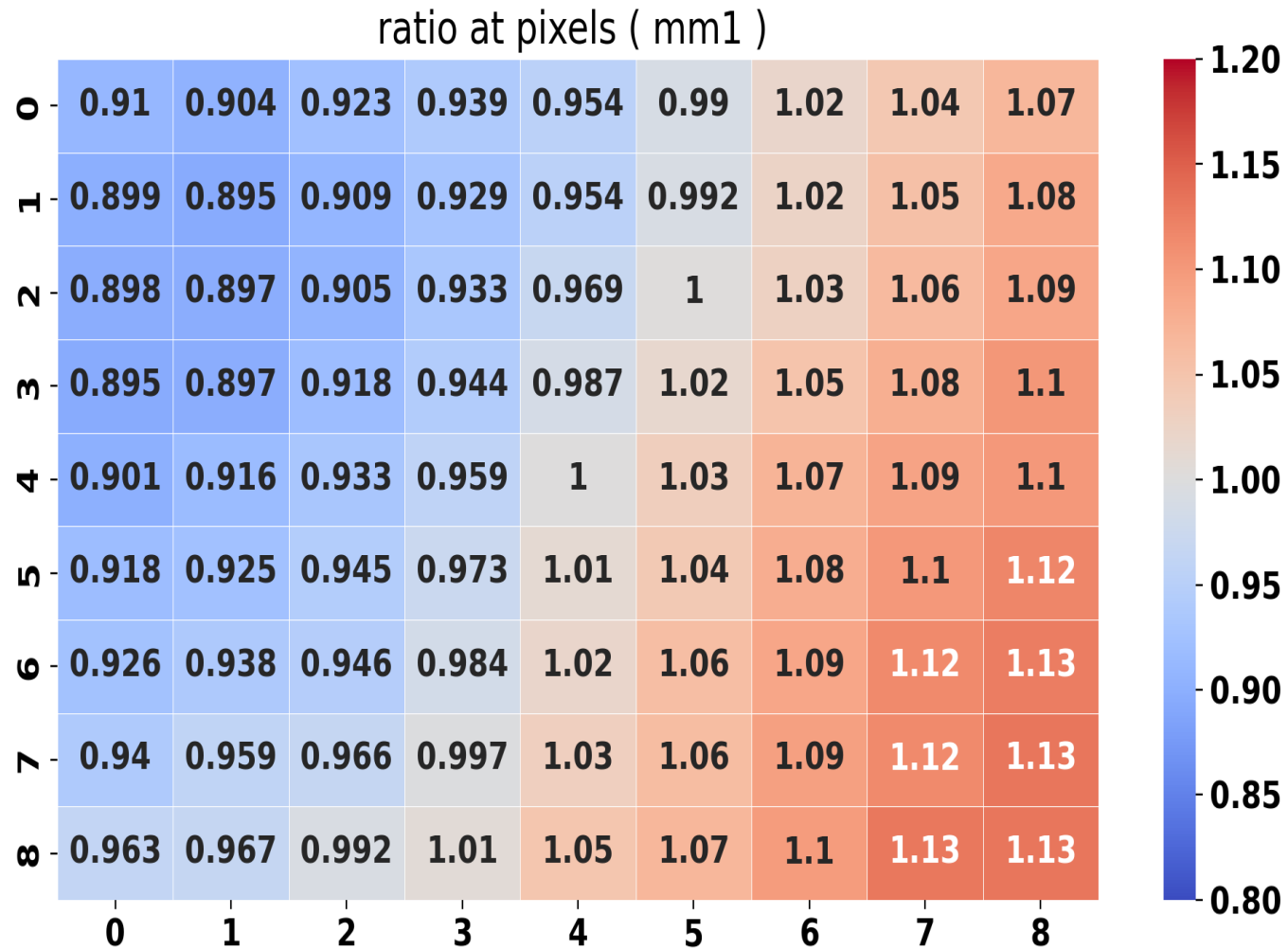
Probability Content, p , between χ^2 and $+\infty$

0.99 5	0.99	0.97 5	0.95	0.9	0.75	0.5	0.25	0.1	0.05	0.02 5	0.01	0.00 5	0.00 2	0.00 1	
38.6	40.6	43.7	46.5	49.9	56.0	63.3	71.2	78.8	83.6	88.0	93.2	96.8	101. 4	104. 7	10

Related change (RHC vs FHC)

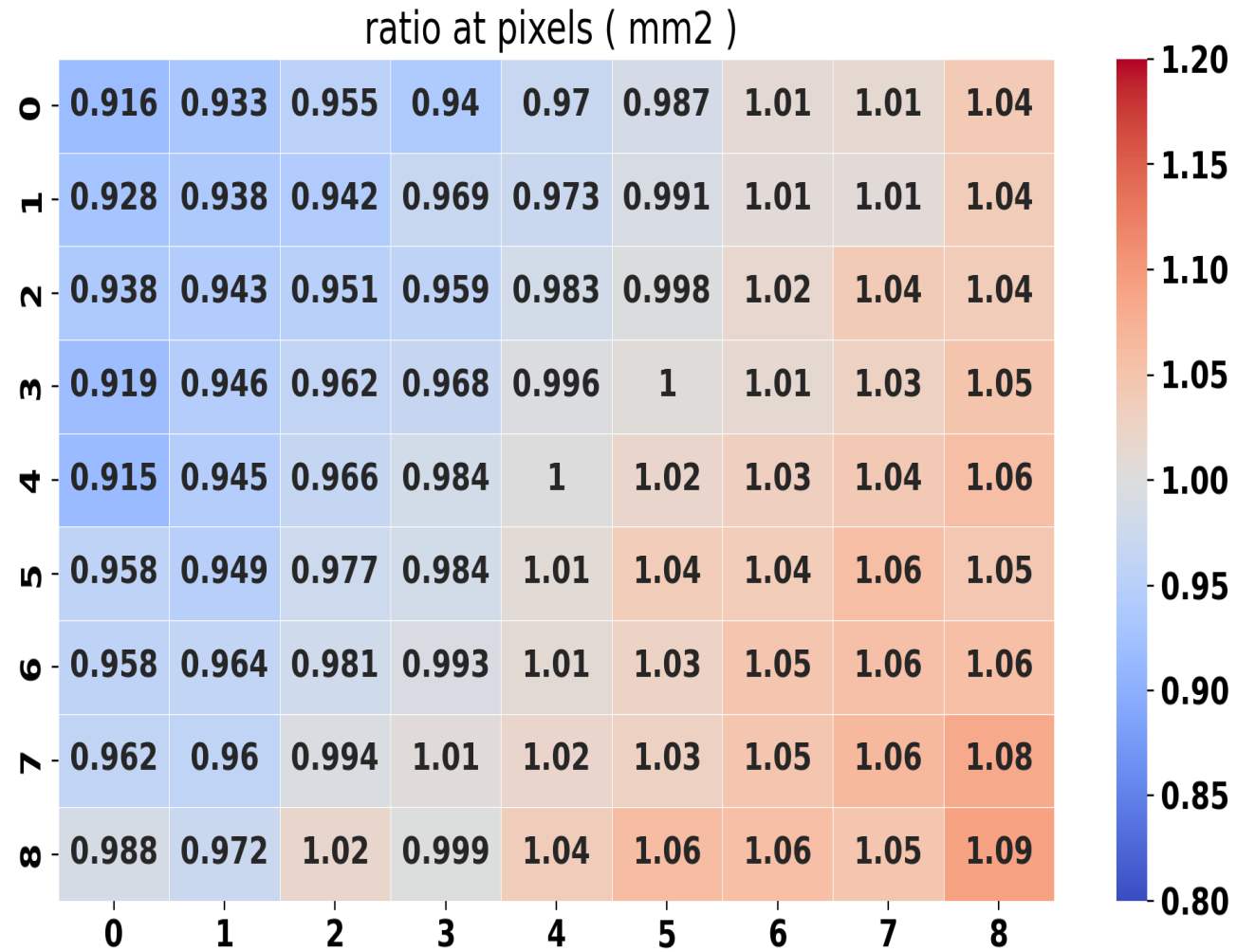
Simulation

$B_x = 0.1$ Gauss, $B_y = -0.3$ Gauss, $B_z = -0.07$ Gauss



Simulation

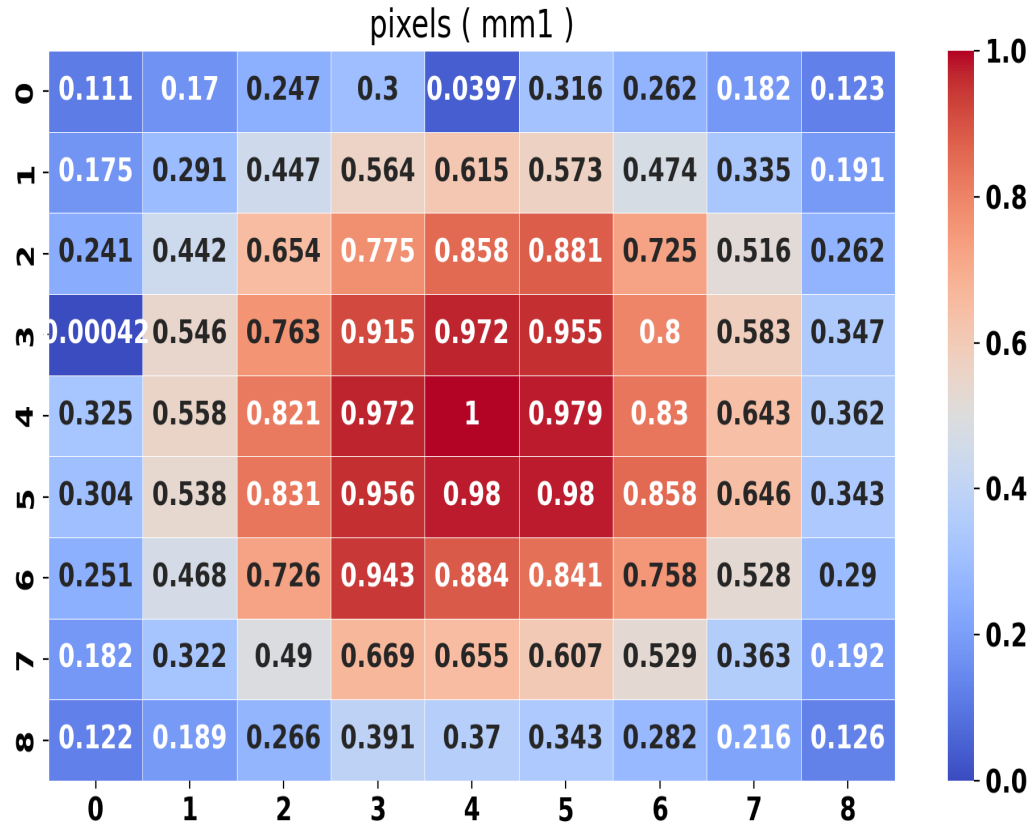
$B_x = 0.1$ Gauss, $B_y = -0.3$ Gauss, $B_z = -0.07$ Gauss



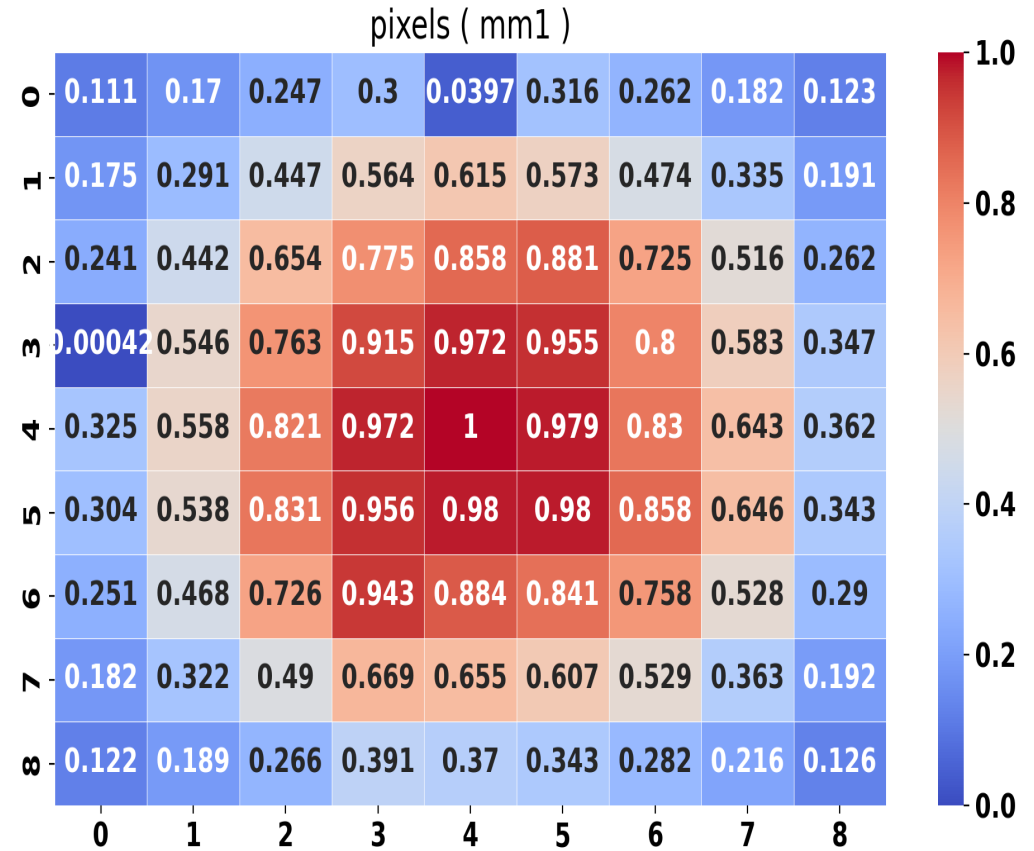
Data

MM1

FHC



RHC

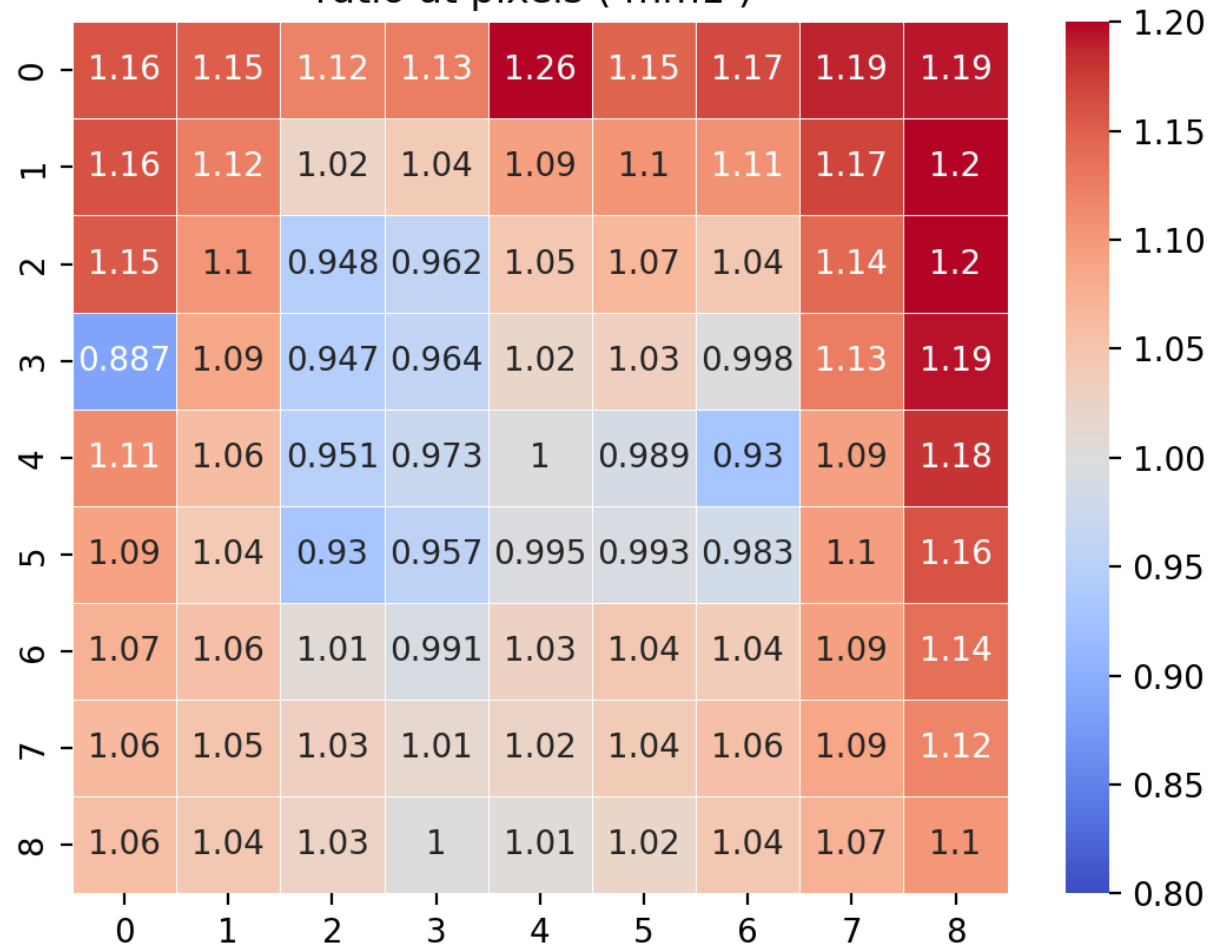


Data

MM1

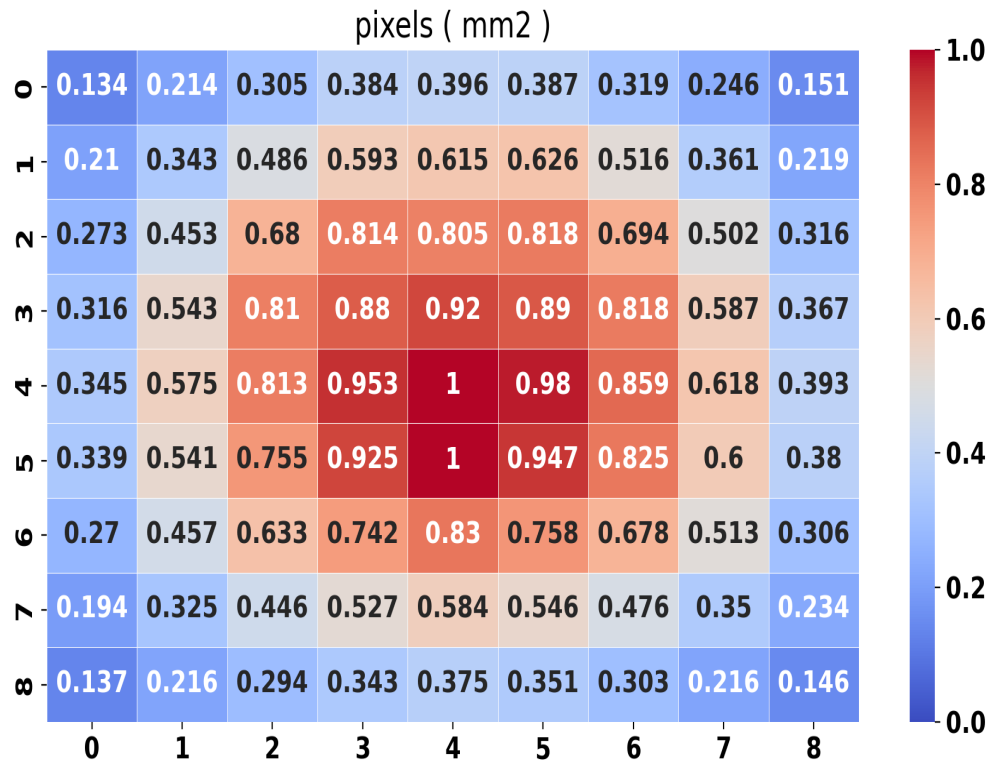
RHC/FHC

ratio at pixels (mm1)

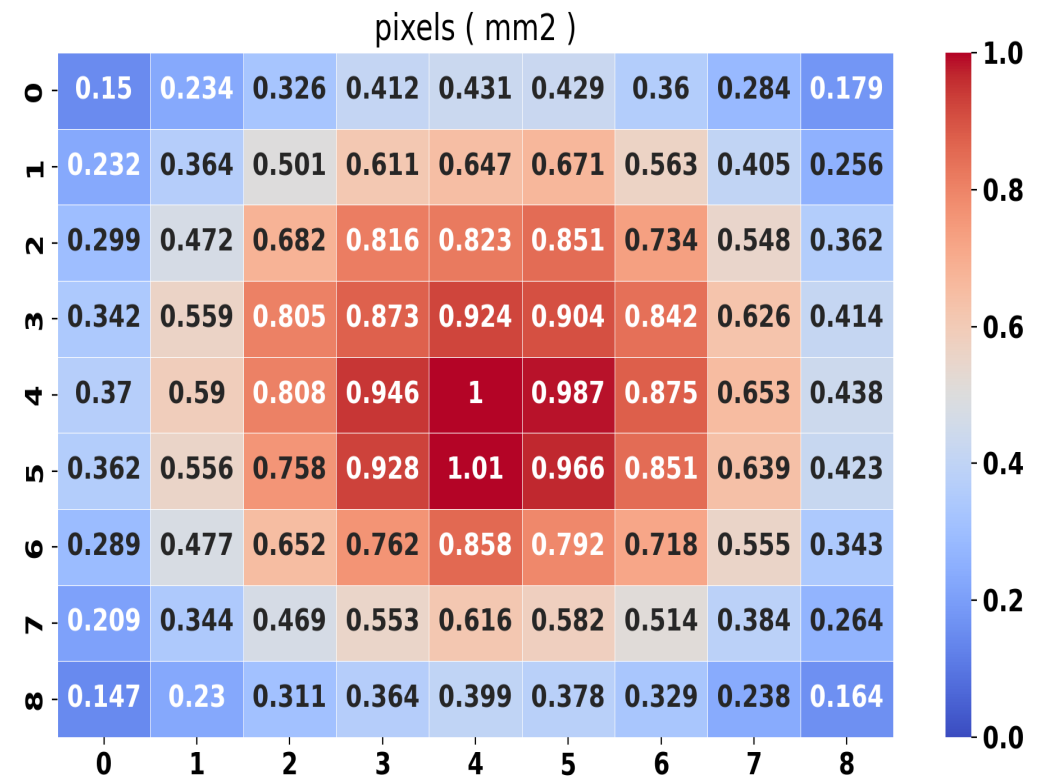


MM2

FHC

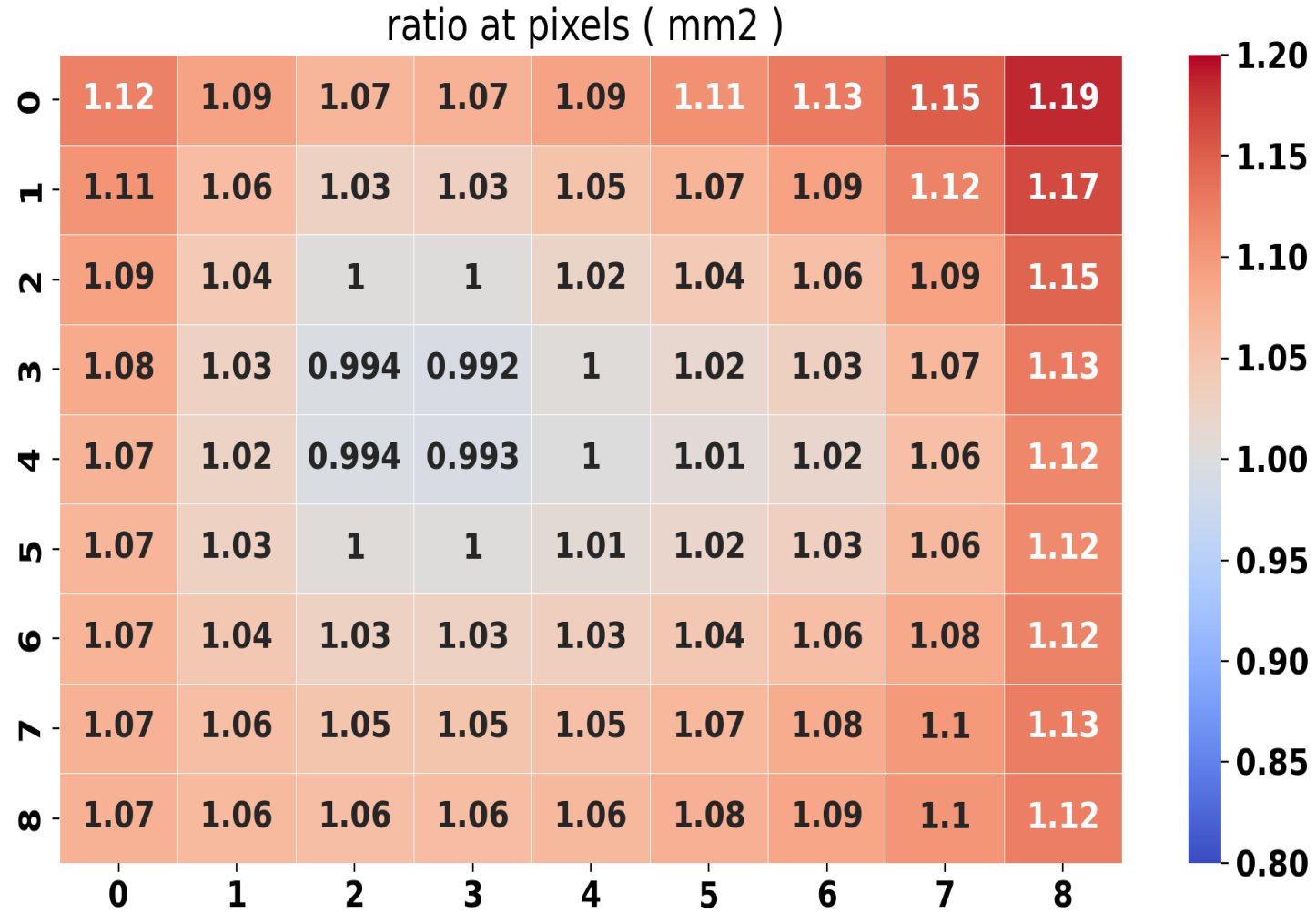


RHC



Data

MM2



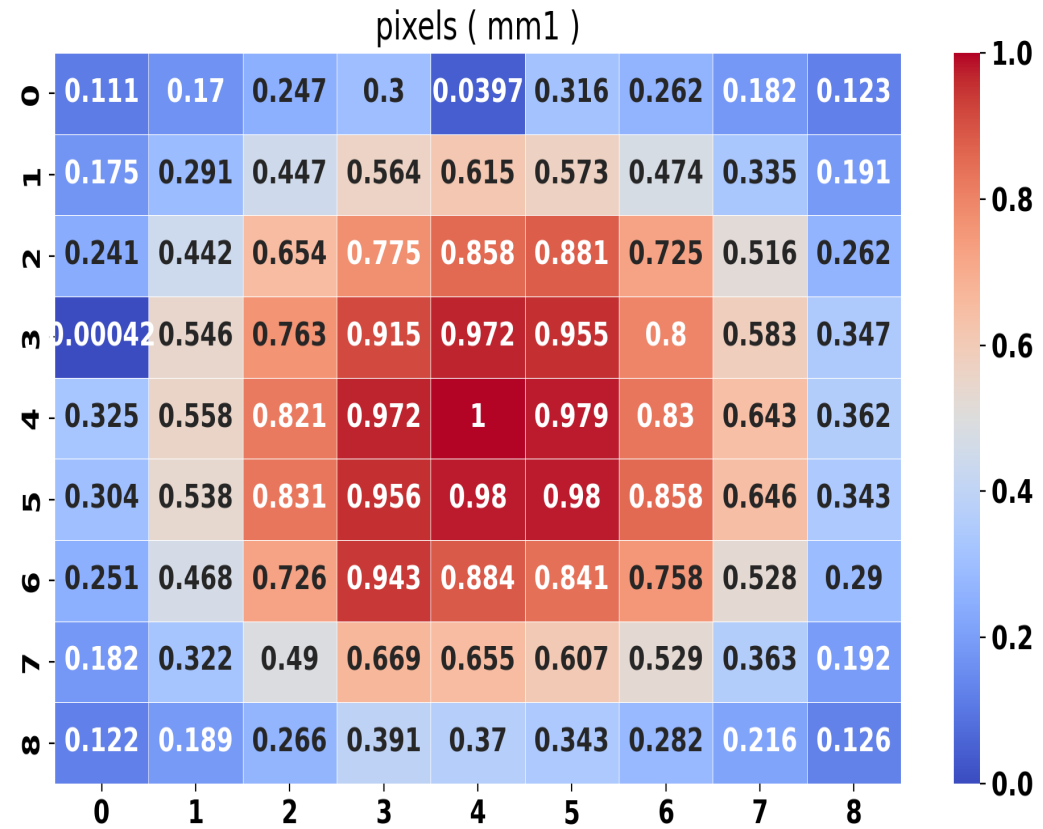
FHC

x_mean = 36.4 mm

y_mean = -14.0 mm

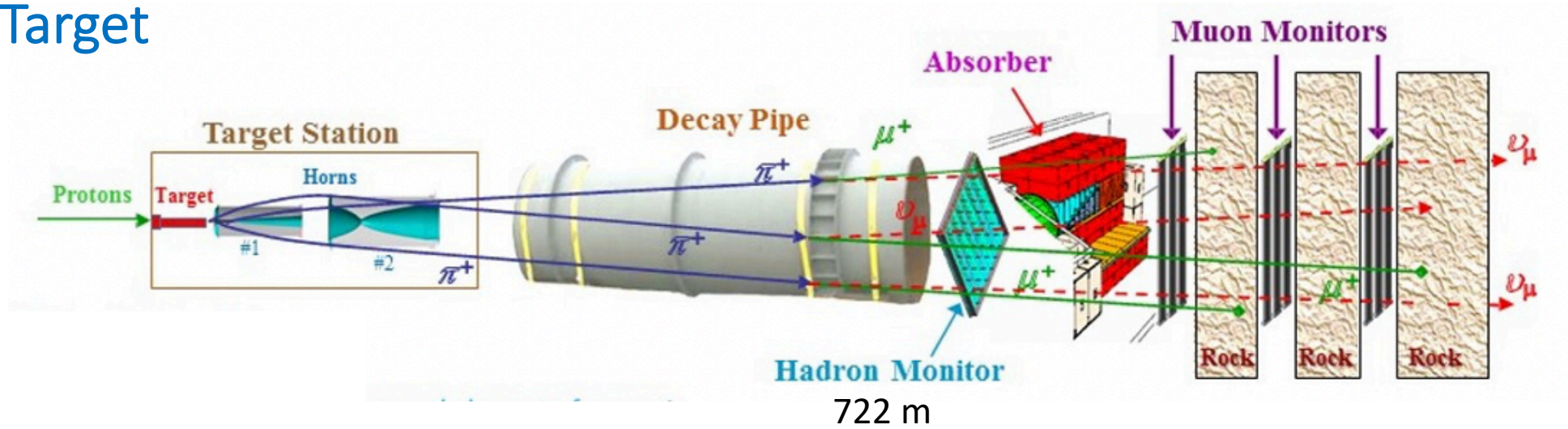
x_mean = 8.9 mm
(5*5 pixels)

y_mean = 1.5 mm
(5*5 pixels)



Horn focus effect

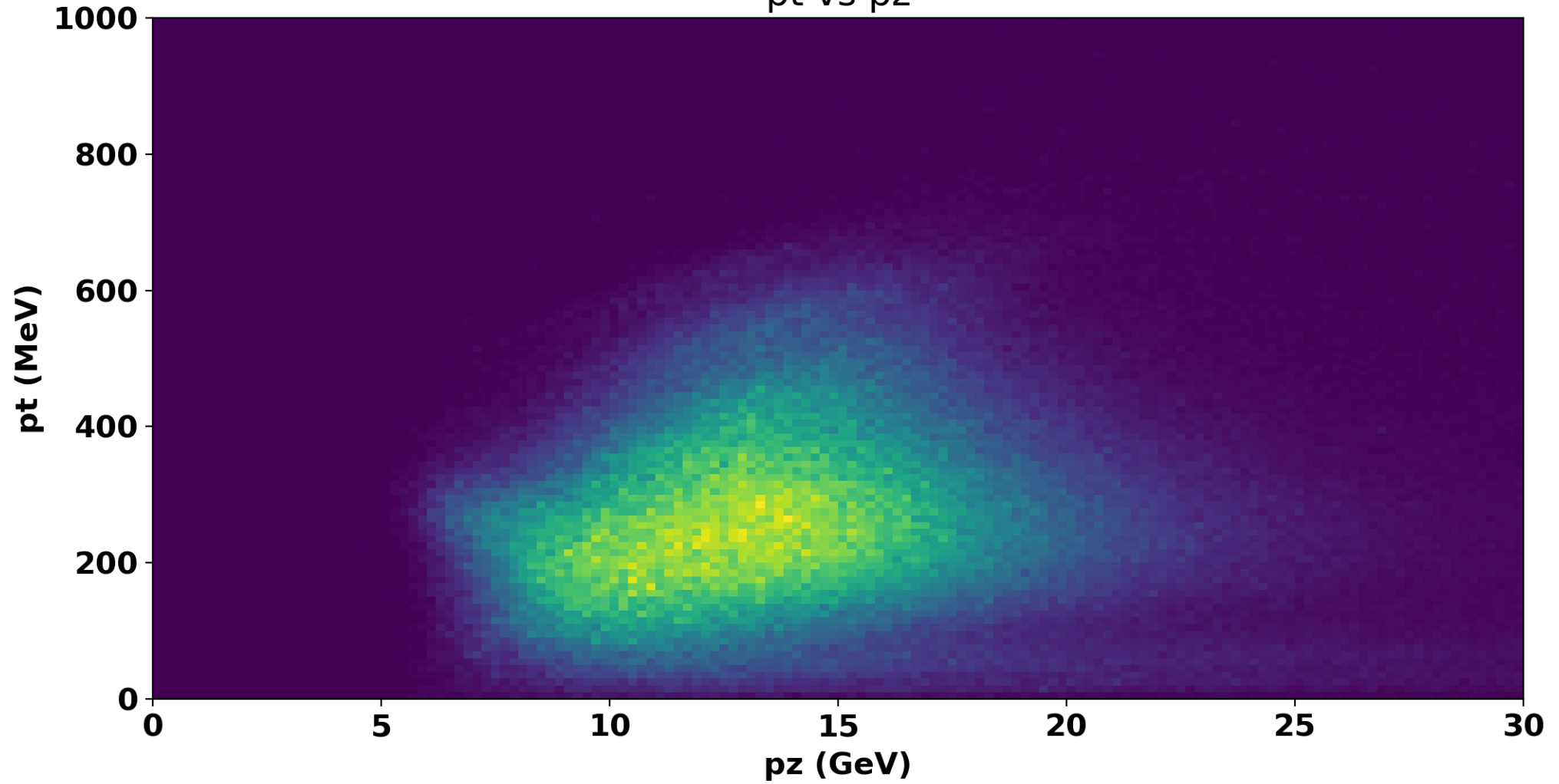
After Target



- Z-tuple simulation:
 - A virtual detector after the target
 - Particle ID
 - Momentum
 - Position
 - Importance weights

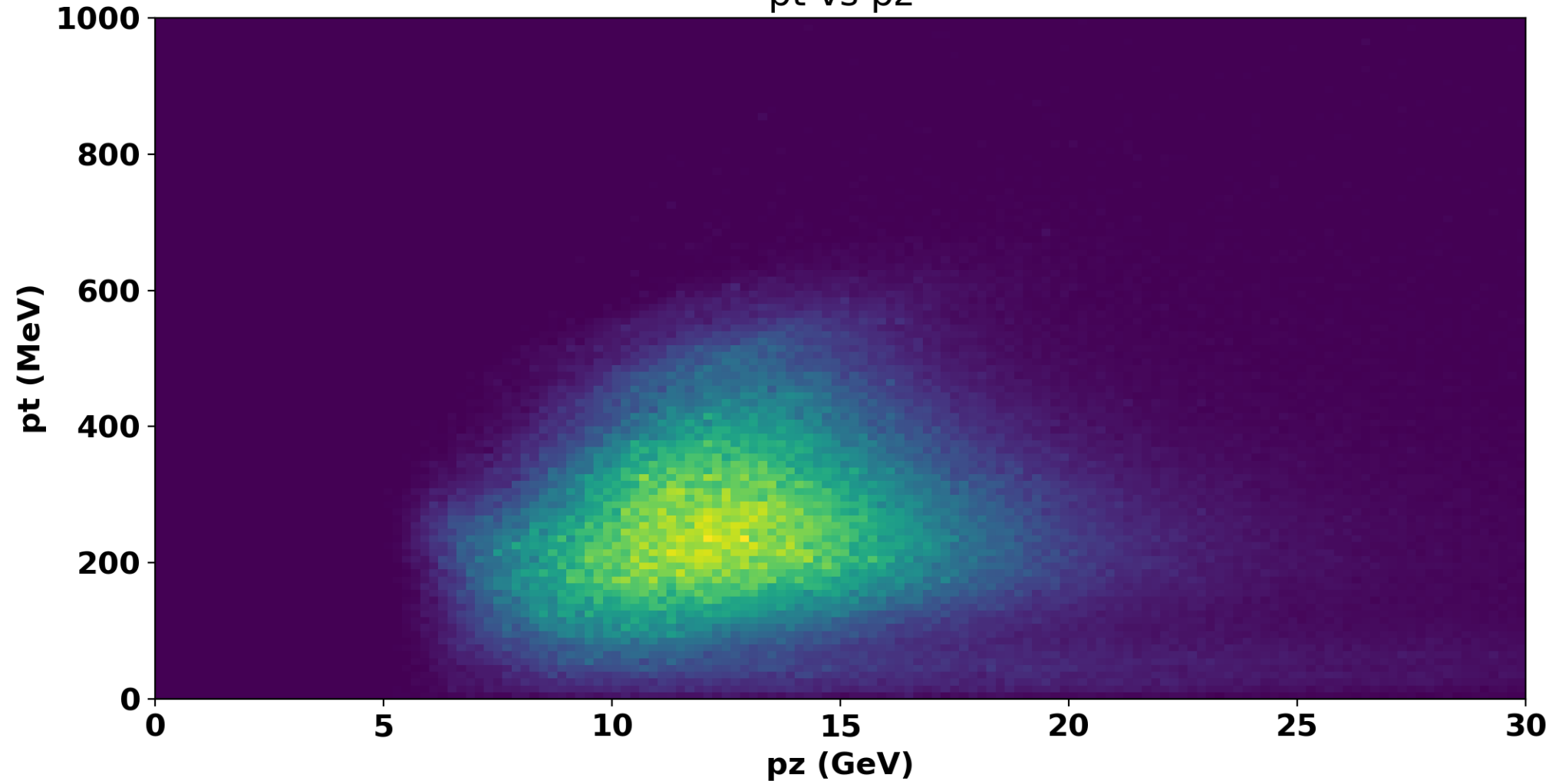
200 kA

pt vs pz



180 kA

pt vs pz



160 kA

pt vs pz

