C. Quintans, coral-weekly, 28/05/2021

2D detector efficiencies from 2018 data

Period P08, processed in the t8 conditions

Data processed by Chia-Yu Hsieh, at Frontera
No smoothing applied yet
Average efficiency per plane computed as arithmetic mean of the bins efficiencies
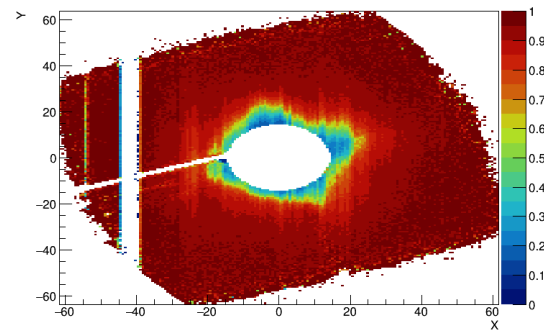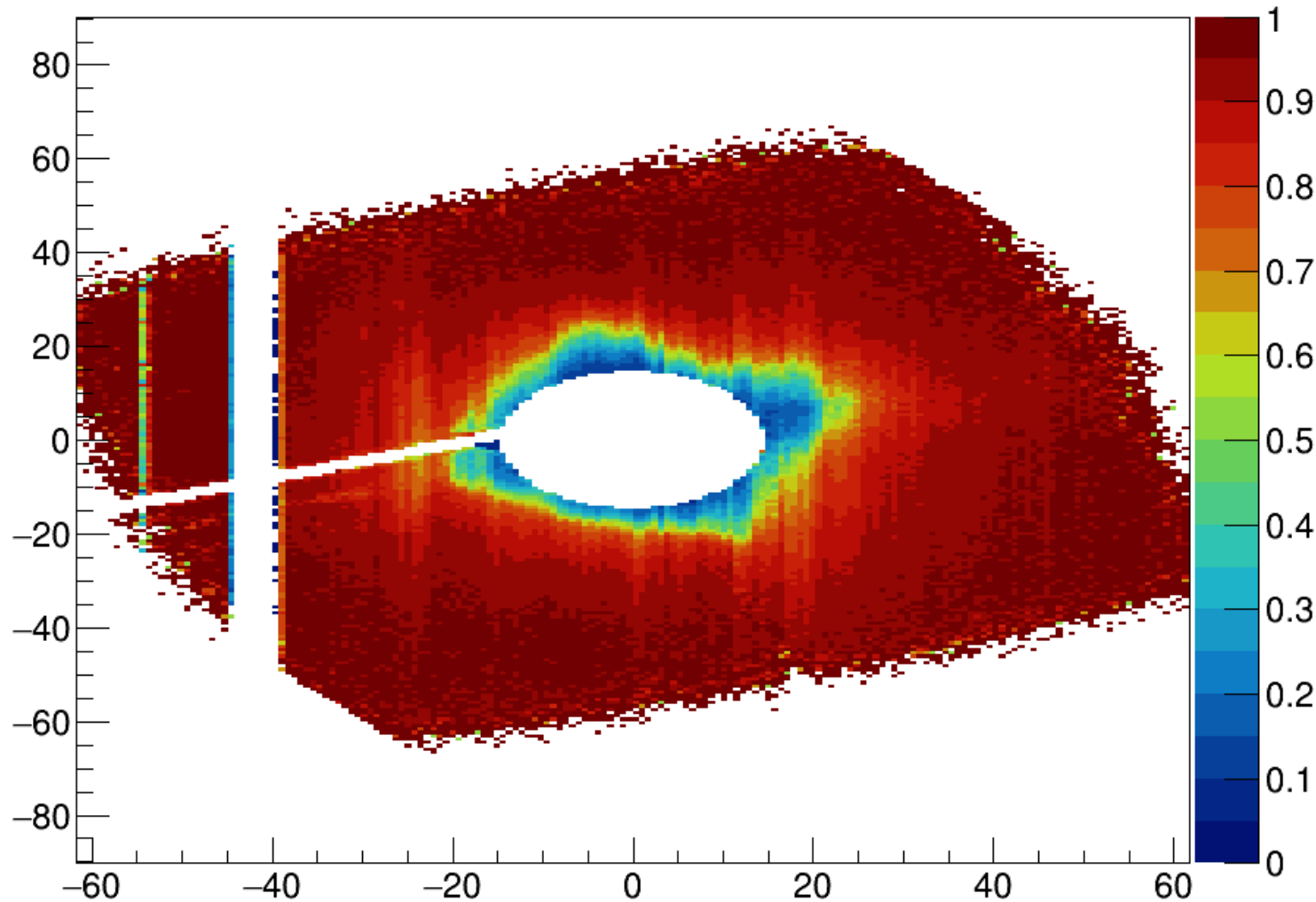New code of U11 is used (affects the plots axes, for rotated planes)
~10% of full period statistics was processed, representative of the whole period

Comparisons done with same plane, P05 processed in the conditions of t1 (top-right plots)
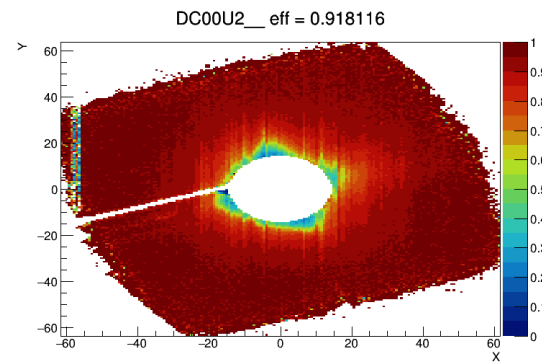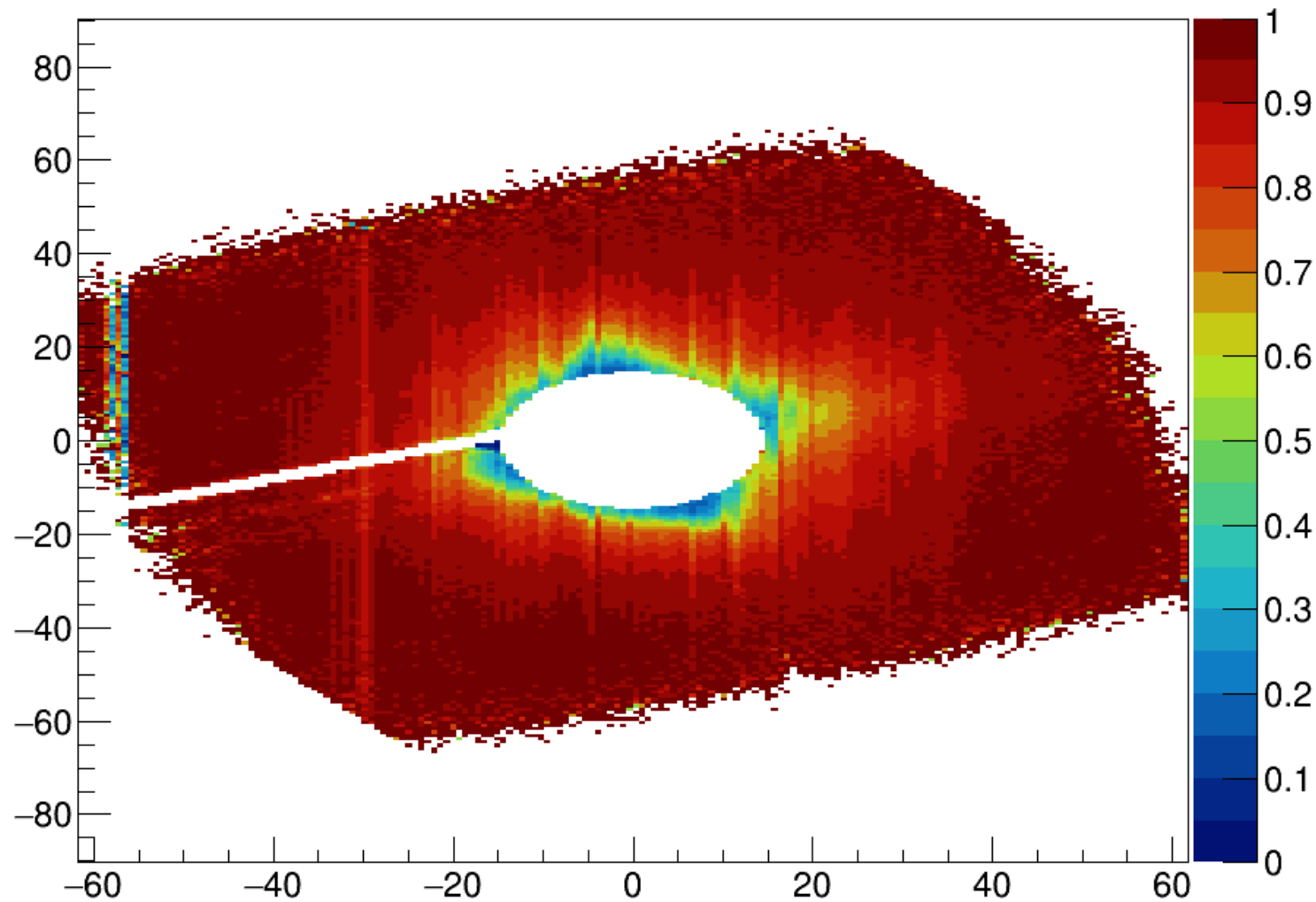
DC00U1__ : Eff. = 0.83215 ± 0.00019
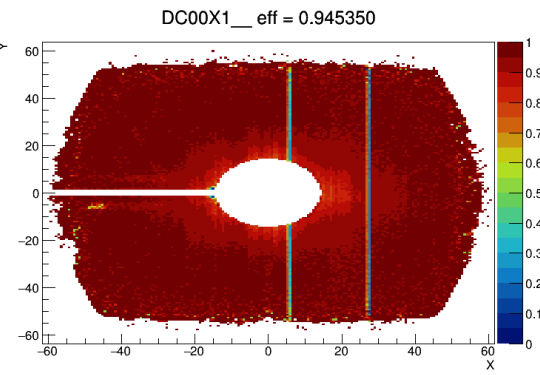
Entries   7.338746e+07

DC00U1__ eff = 0.897165

P05t1

DC00U2__ : Eff. = 0.89193 ± 0.00018

Entries 7.370297e+07

DC00U2__ eff = 0.918116

P05t1

DC00X1__ : Eff. = 0.94027 ± 0.00017

Entries   7.538258e+07

DC00X1__ eff = 0.945350
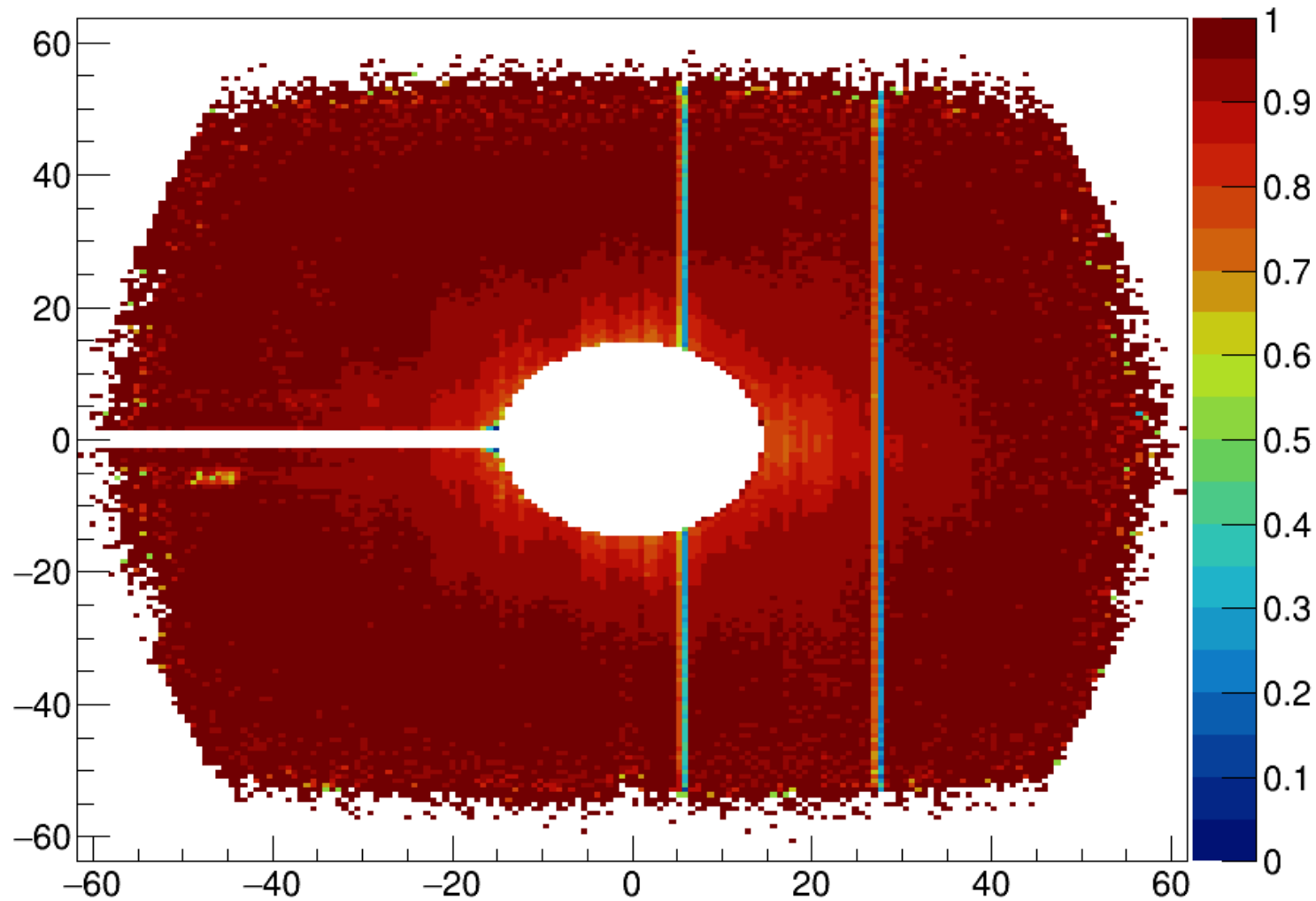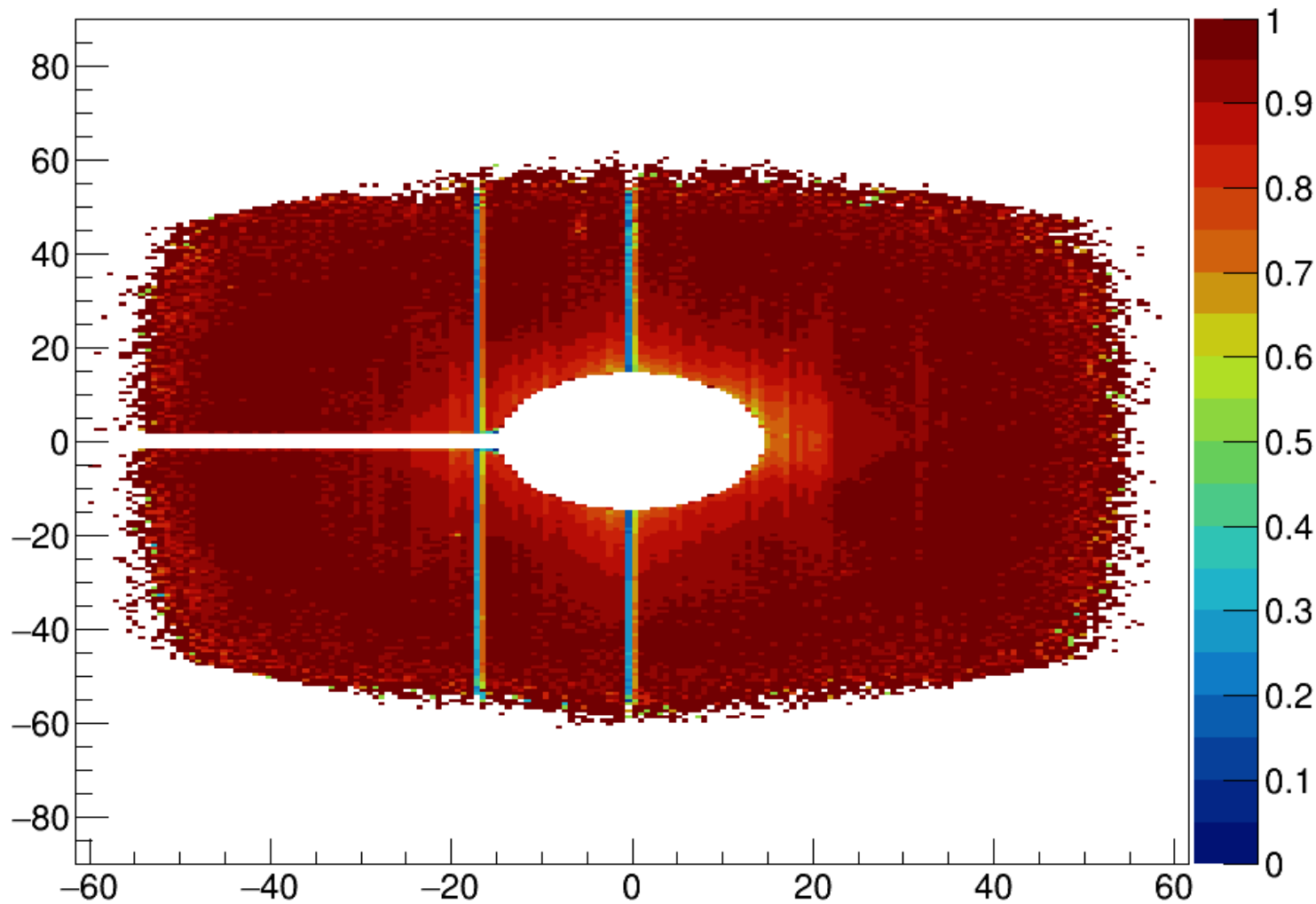
P05t1

DC00X2__ : Eff. = 0.88908 ± 0.00017

Entries   7.570106e+07

DC00X2__ eff = 0.922380
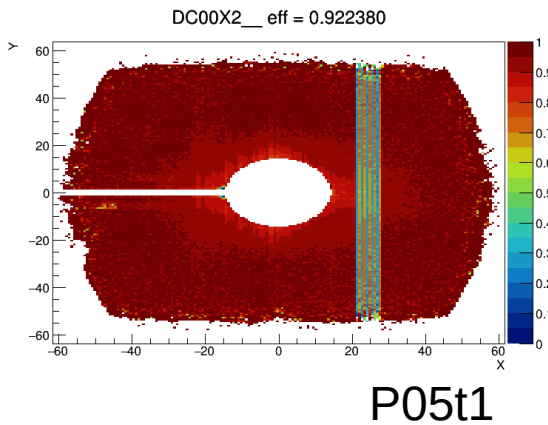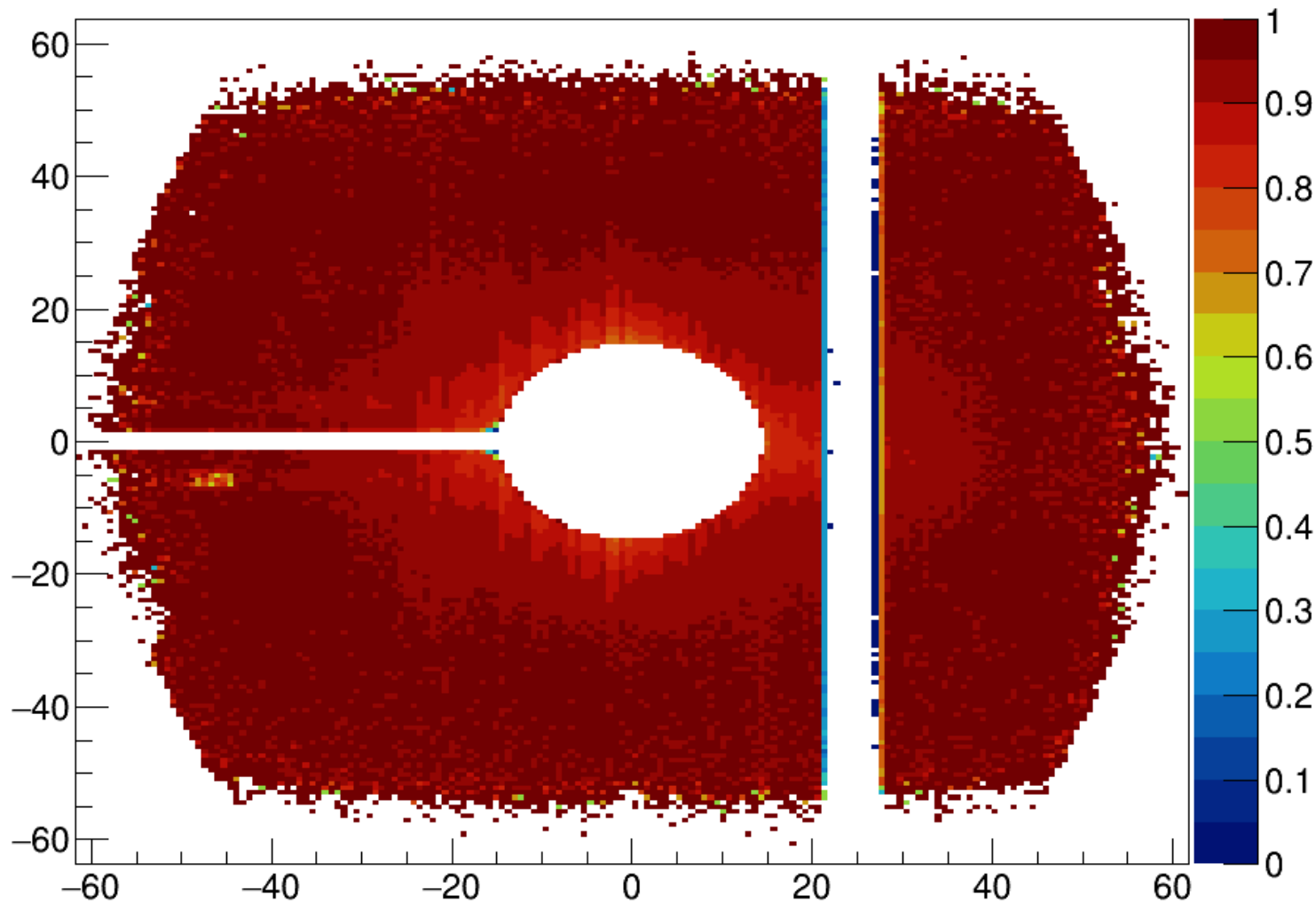
P05t1

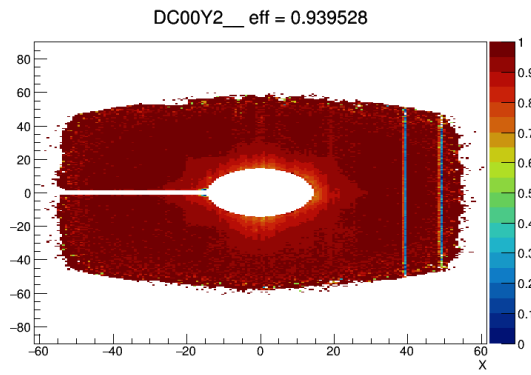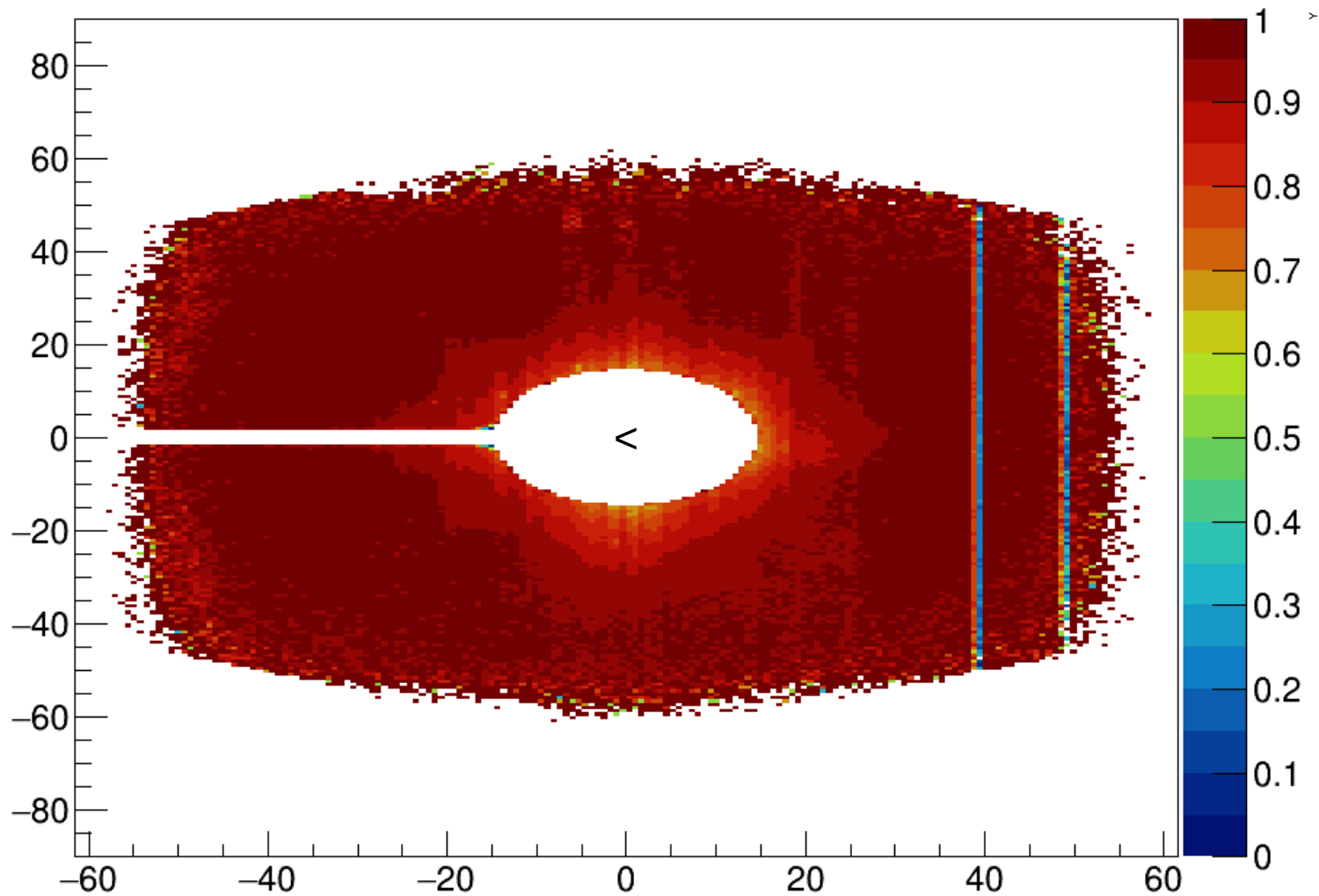**DC00Y1___ : Eff. = 0.92877 ± 0.00018**

Entries 6.810461e+07
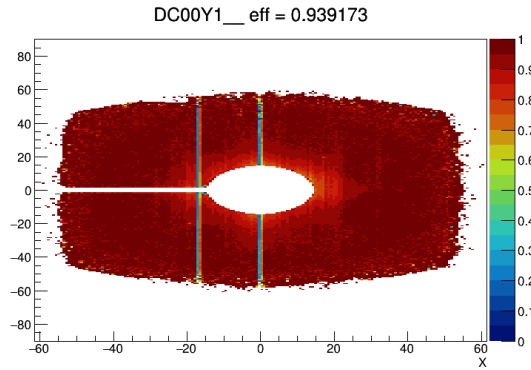
DC00Y1___ eff = 0.939173

P05t1

DC00Y2__ : Eff. = 0.93005 ± 0.00018

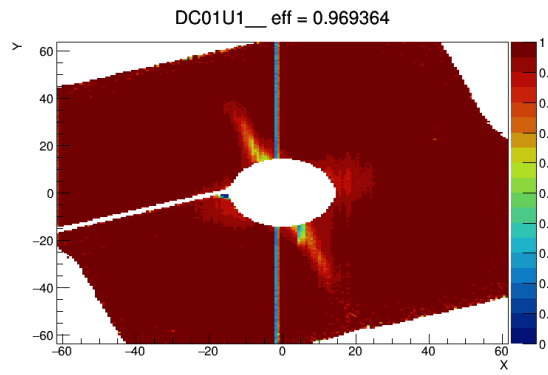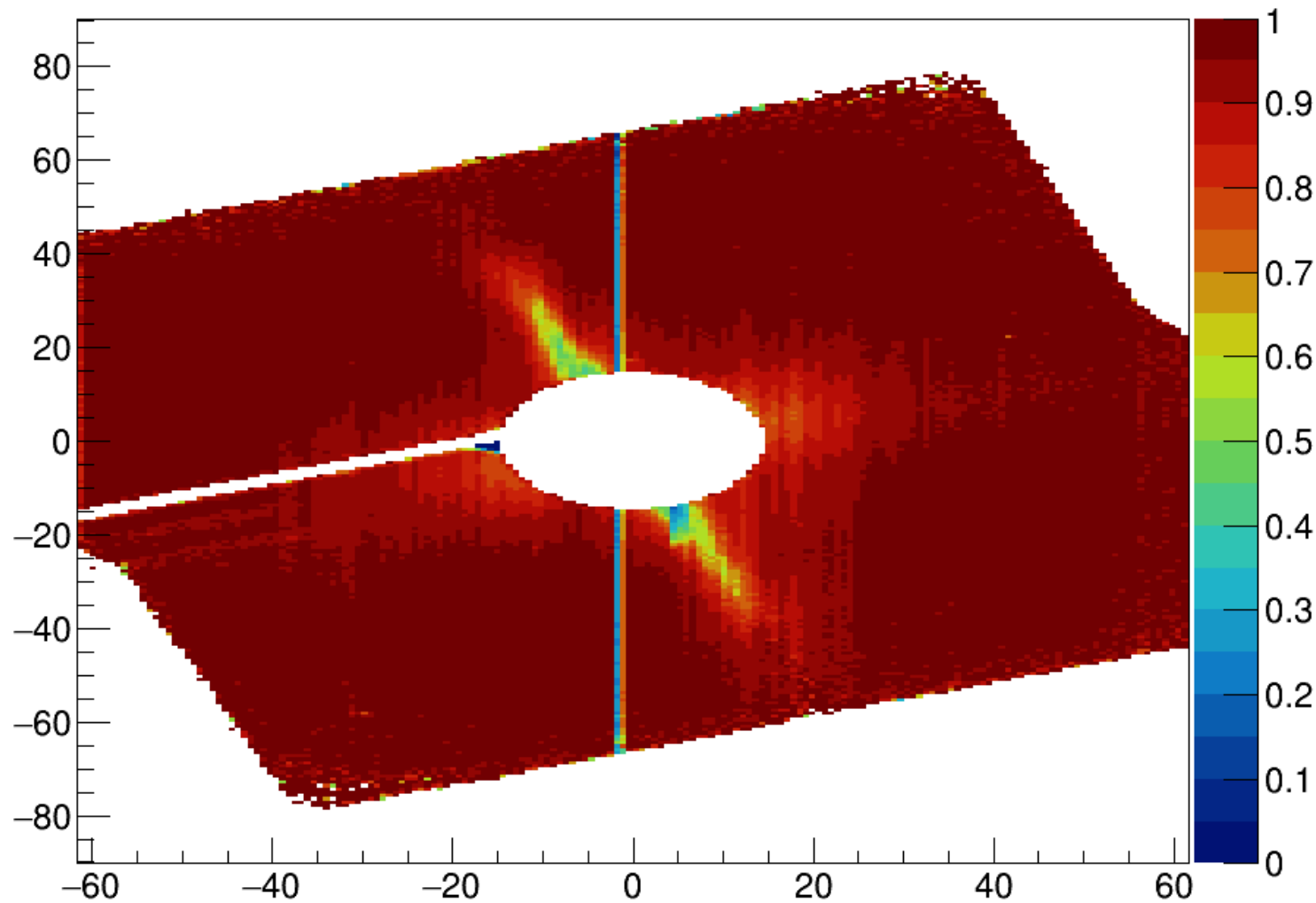Entries 6.840451e+07

DC00Y2__ eff = 0.939528

P05t1

DC01U1__ : Eff. = 0.94065 ± 0.00014

Entries   1.12981e+08

DC01U1__ eff = 0.969364
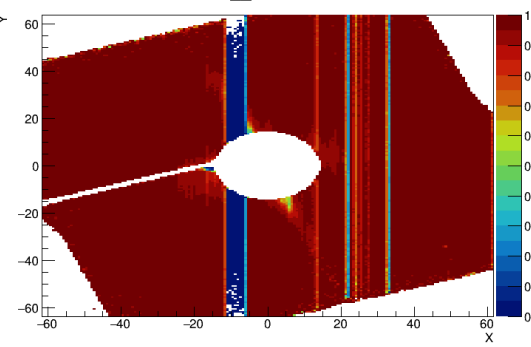
P05t1
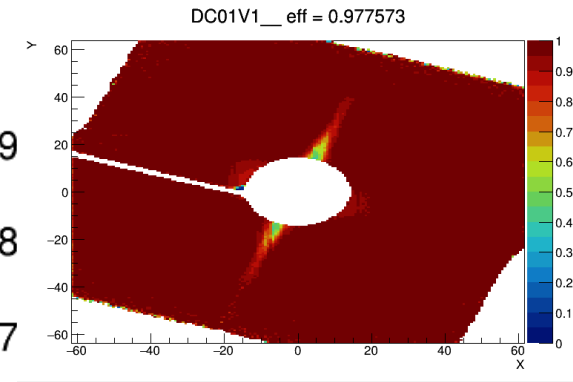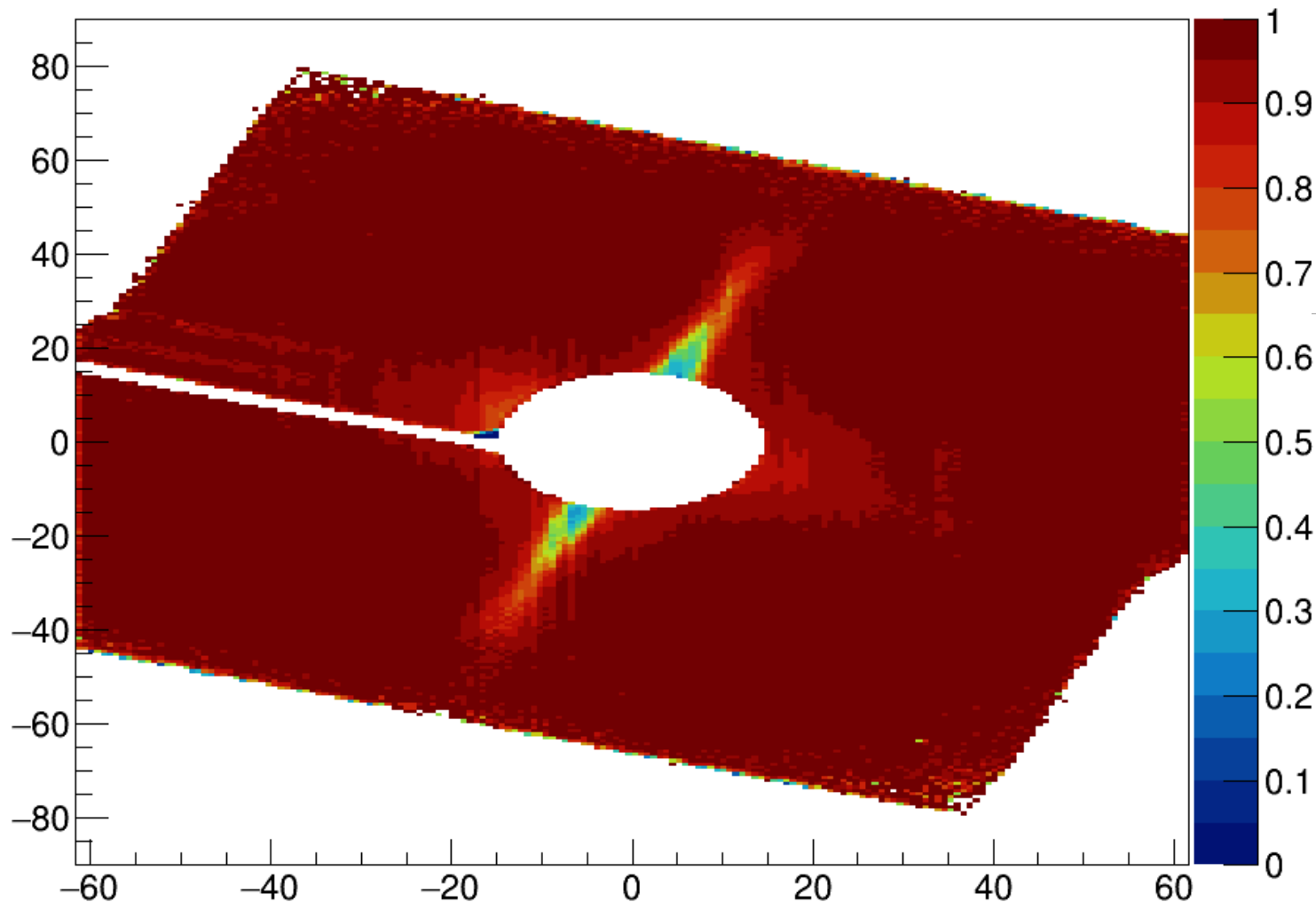
DC01U2__ : Eff. = 0.90584 ± 0.00014

Entries 1.132414e+08
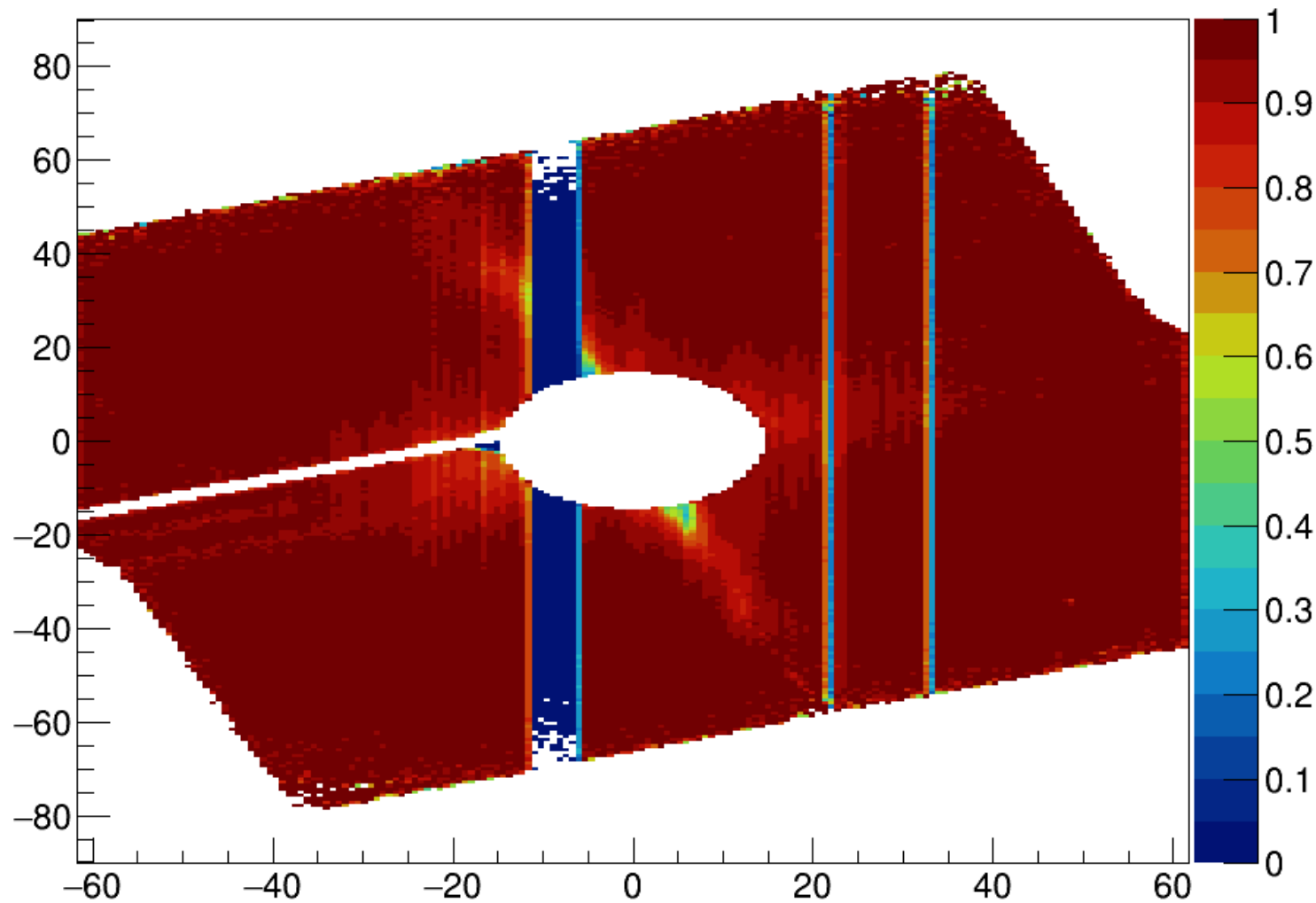
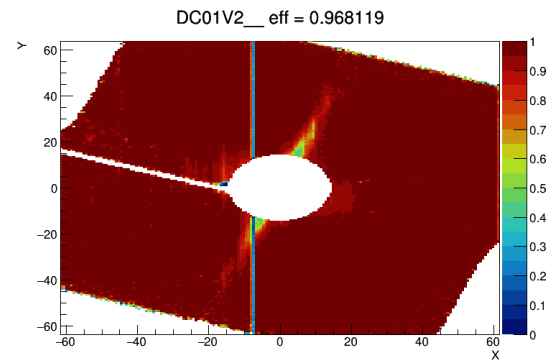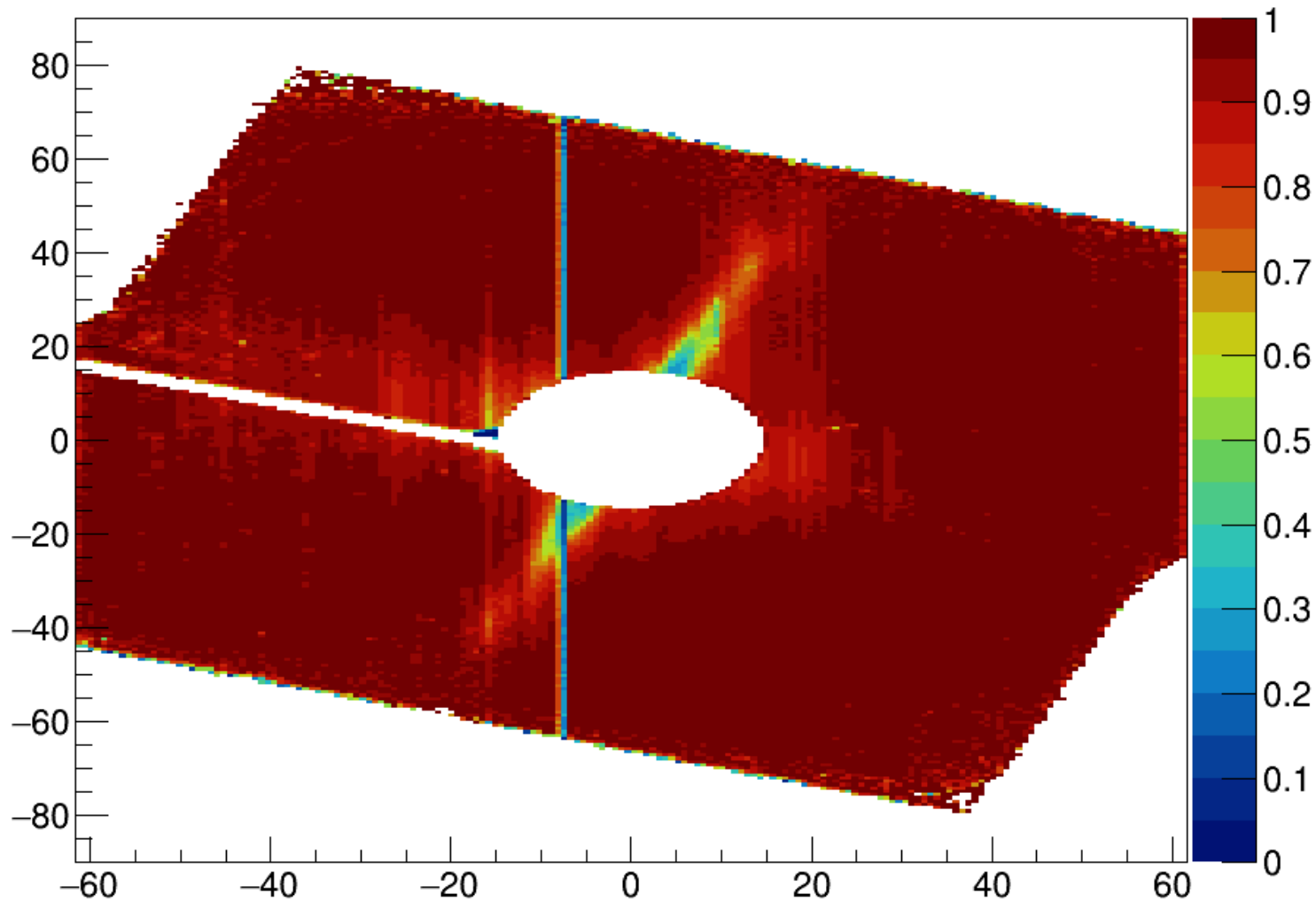DC01U2__ eff = 0.922465

P05t1

DC01V1__ : Eff. = 0.95324 ± 0.00013

Entries   1.146664e+08

DC01V1__ eff = 0.977573

P05t1

DC01V2___ : Eff. = 0.93878 ± 0.00014

Entries 1.149317e+08

DC01V2___ eff = 0.968119

P05t1

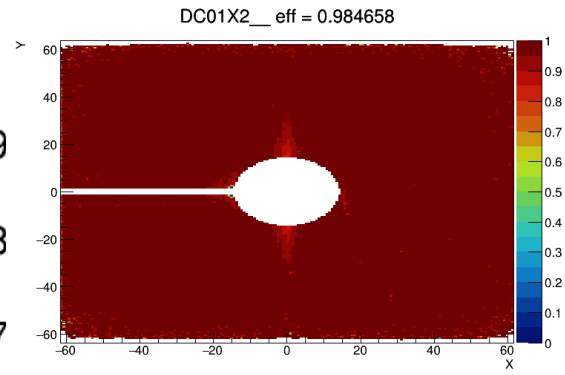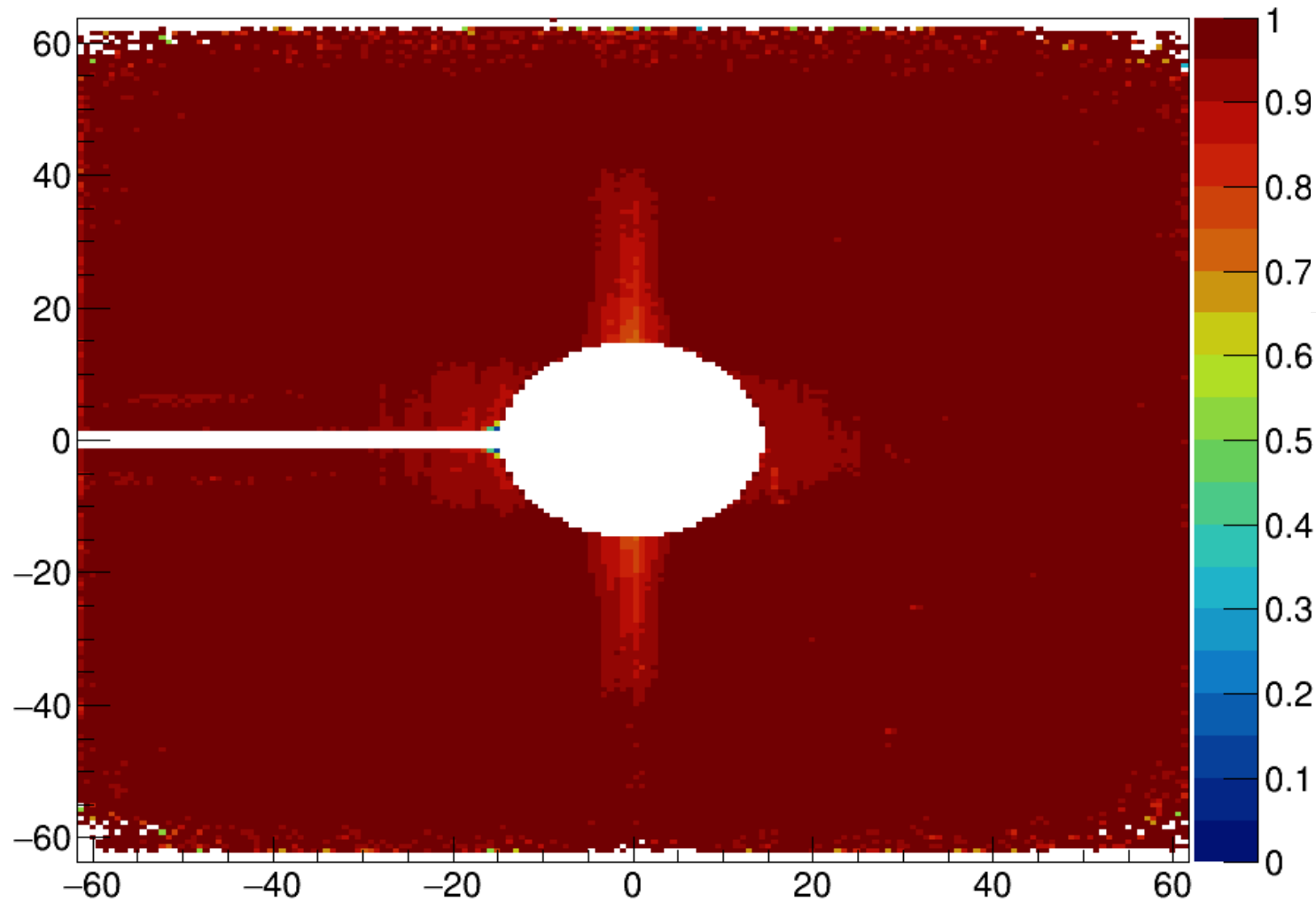**DC01X1__ : Eff. = 0.96871 ± 0.00014**

Entries 1.082011e+08

DC01X1___ eff = 0.981470
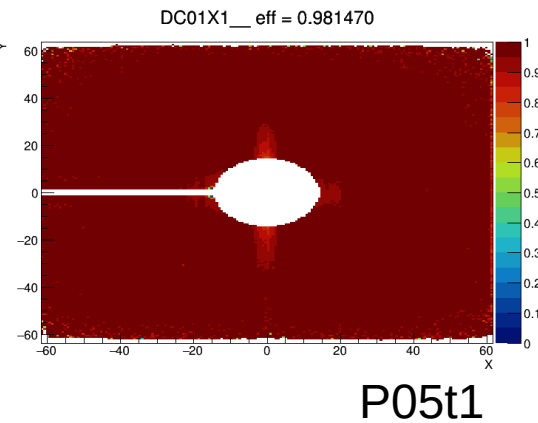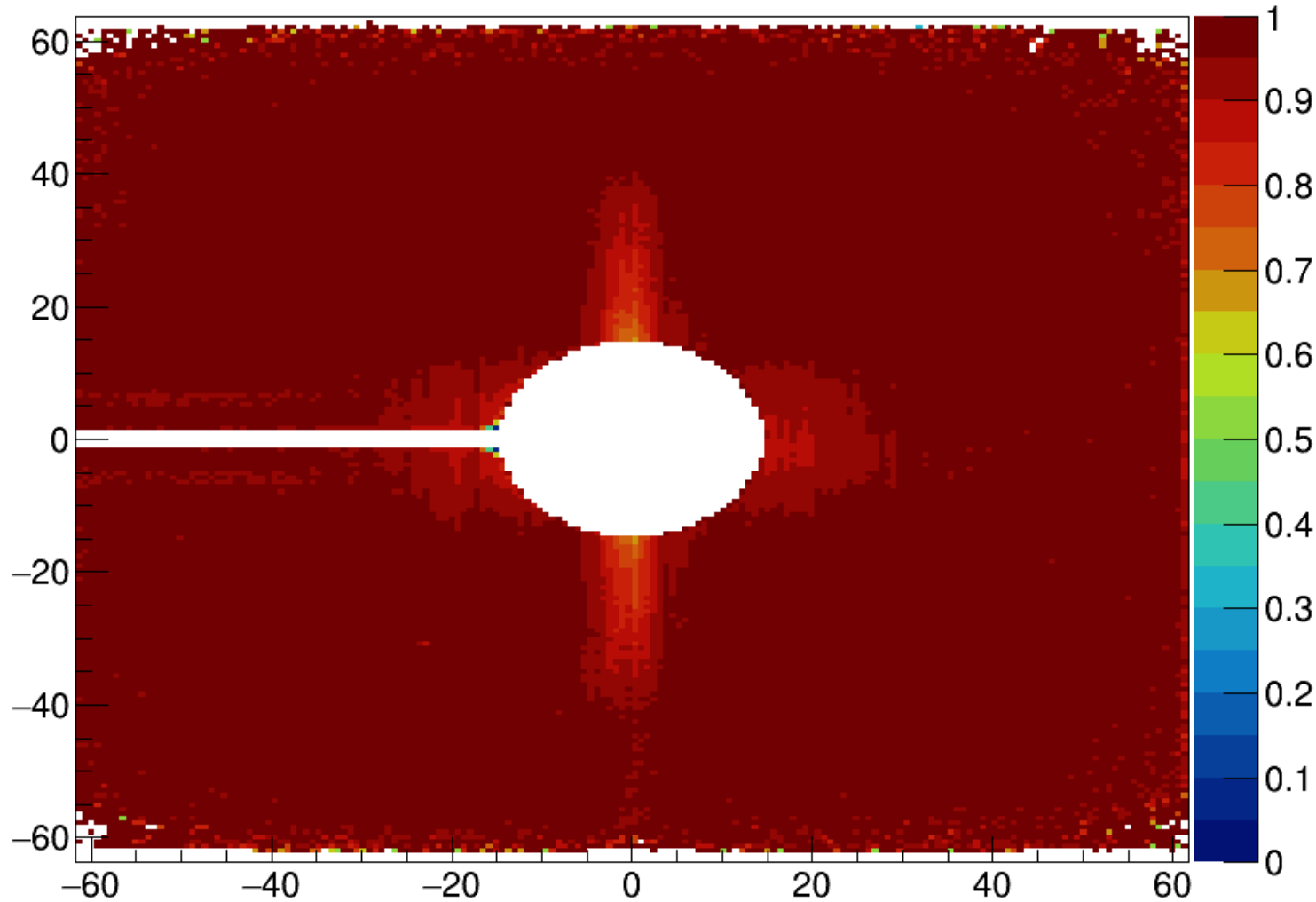
P05t1

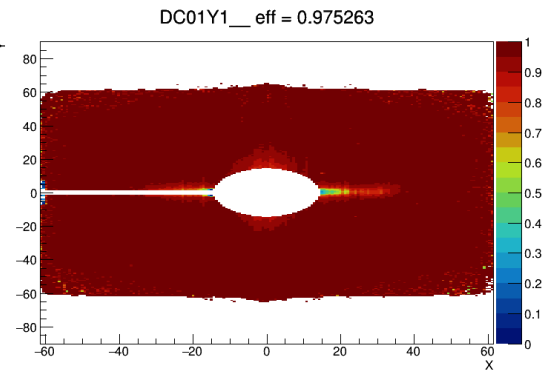**DC01X2__ : Eff. = 0.97451 ± 0.00014**

Entries 1.084538e+08

DC01X2__ eff = 0.984658

P05t1

DC01Y1__ : Eff. = 0.95776 ± 0.00014

Entries   1.056659e+08

DC01Y1__ eff = 0.975263
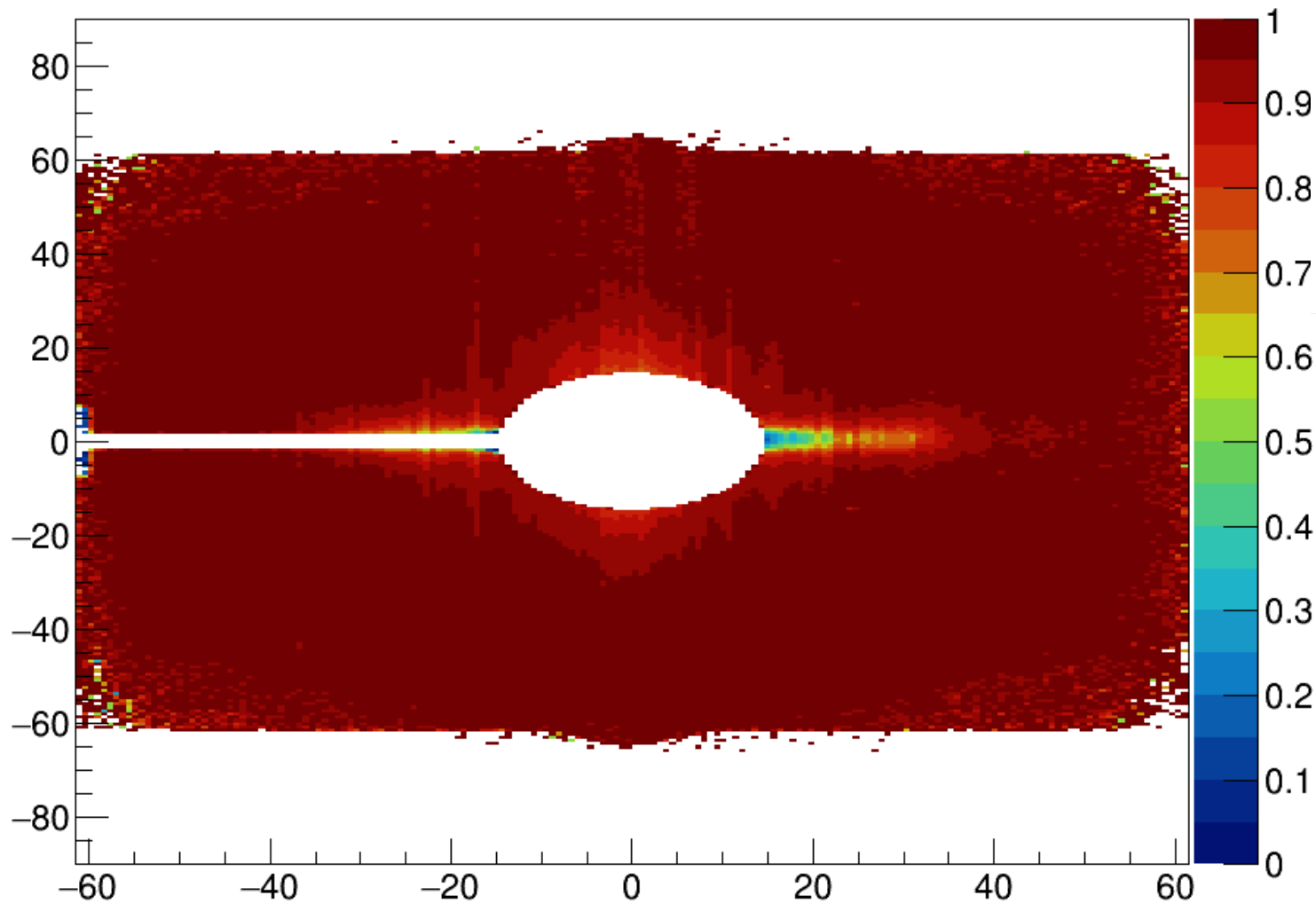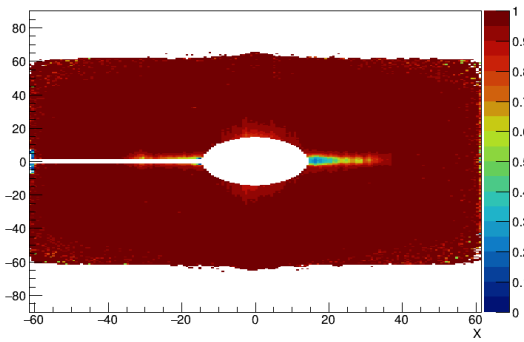

P05t1

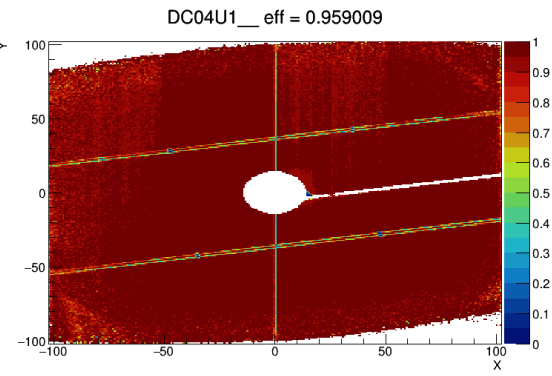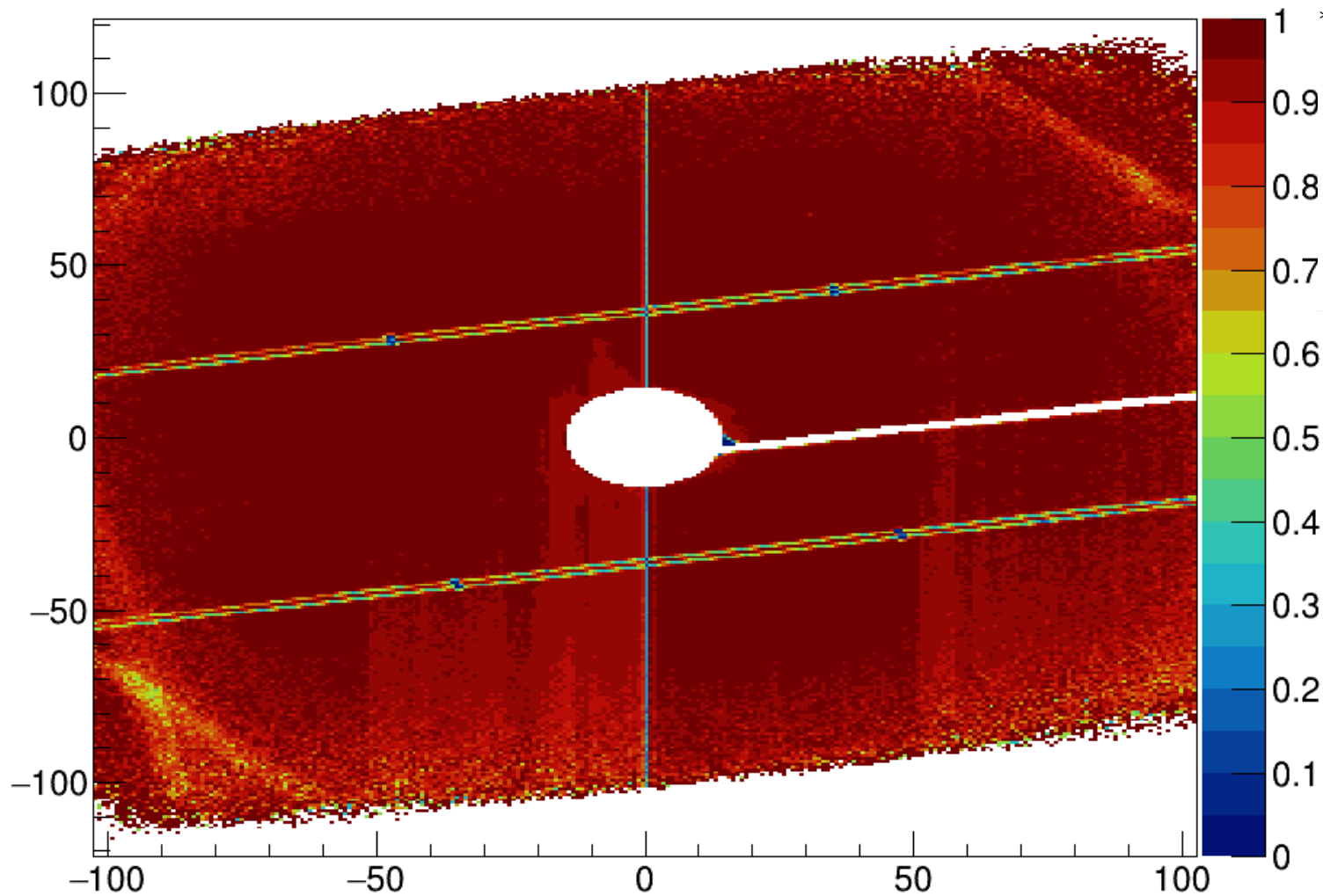**DC01Y2__ : Eff. = 0.95513 ± 0.00014**

Entries   1.059343e+08
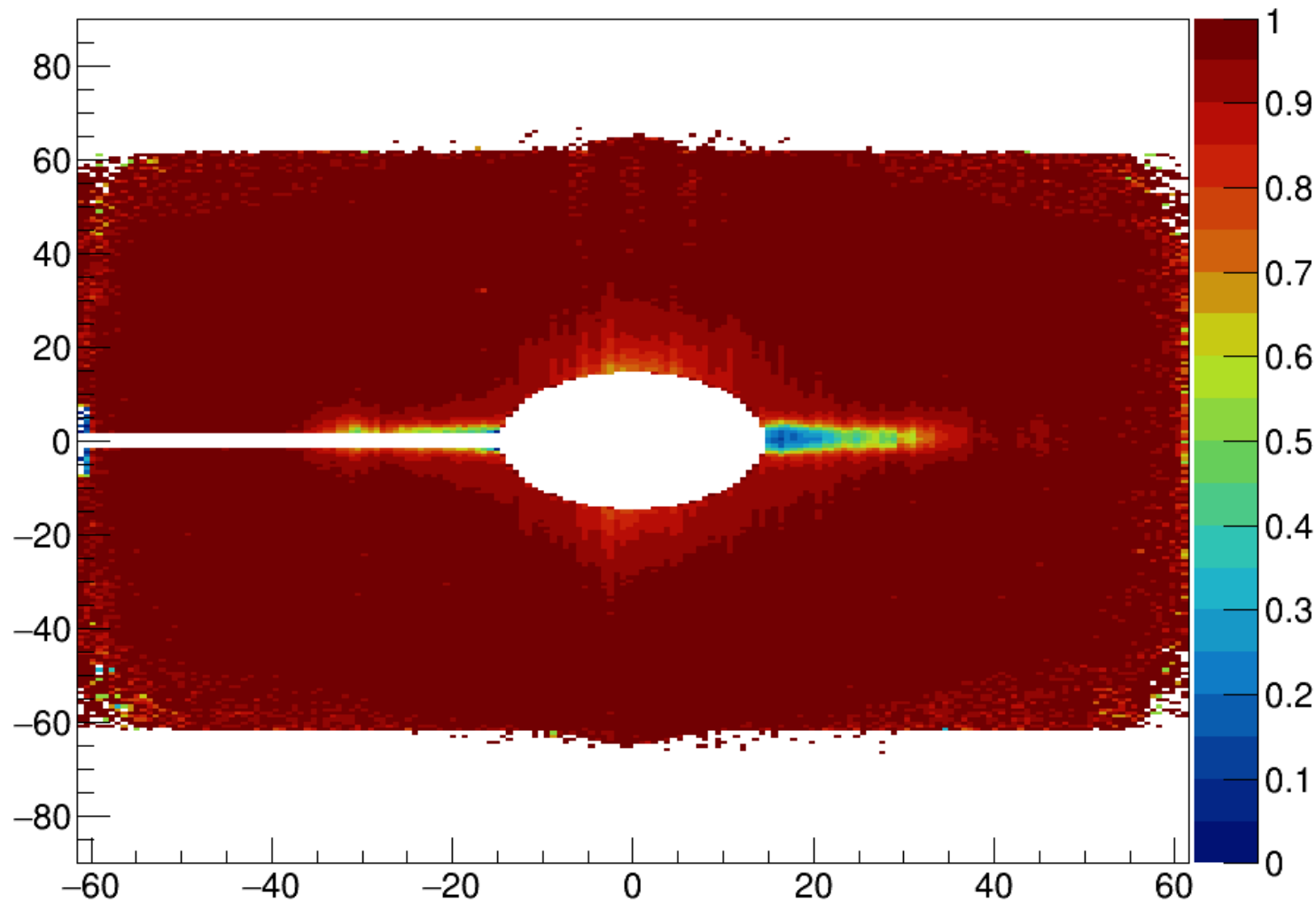
DC01Y2__ eff = 0.973320

P05t1

DC04U1__ : Eff. = 0.93459 ± 0.00011

Entries 1.643702e+08

DC04U1___ eff = 0.959009

P05t1

DC04U2___ : Eff. = 0.65658 ± 0.00011

Entries   1.643294e+08

DC04U2___ eff = 0.955803
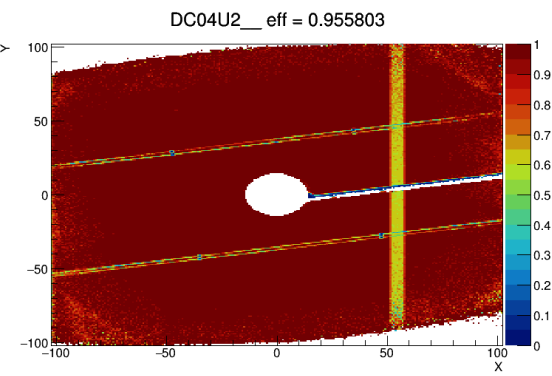
P05t1

DC04V1__ : Eff. = 0.92355 ± 0.00011

Entries 1.626283e+08

DC04V1__ eff = 0.932262
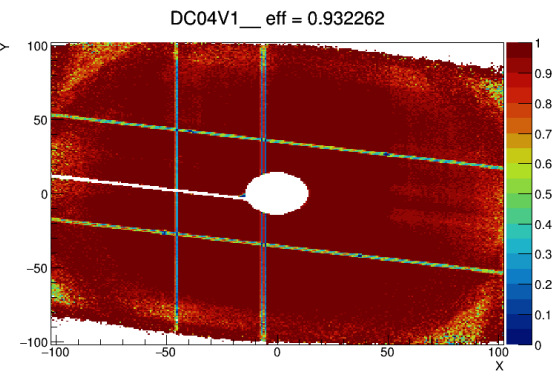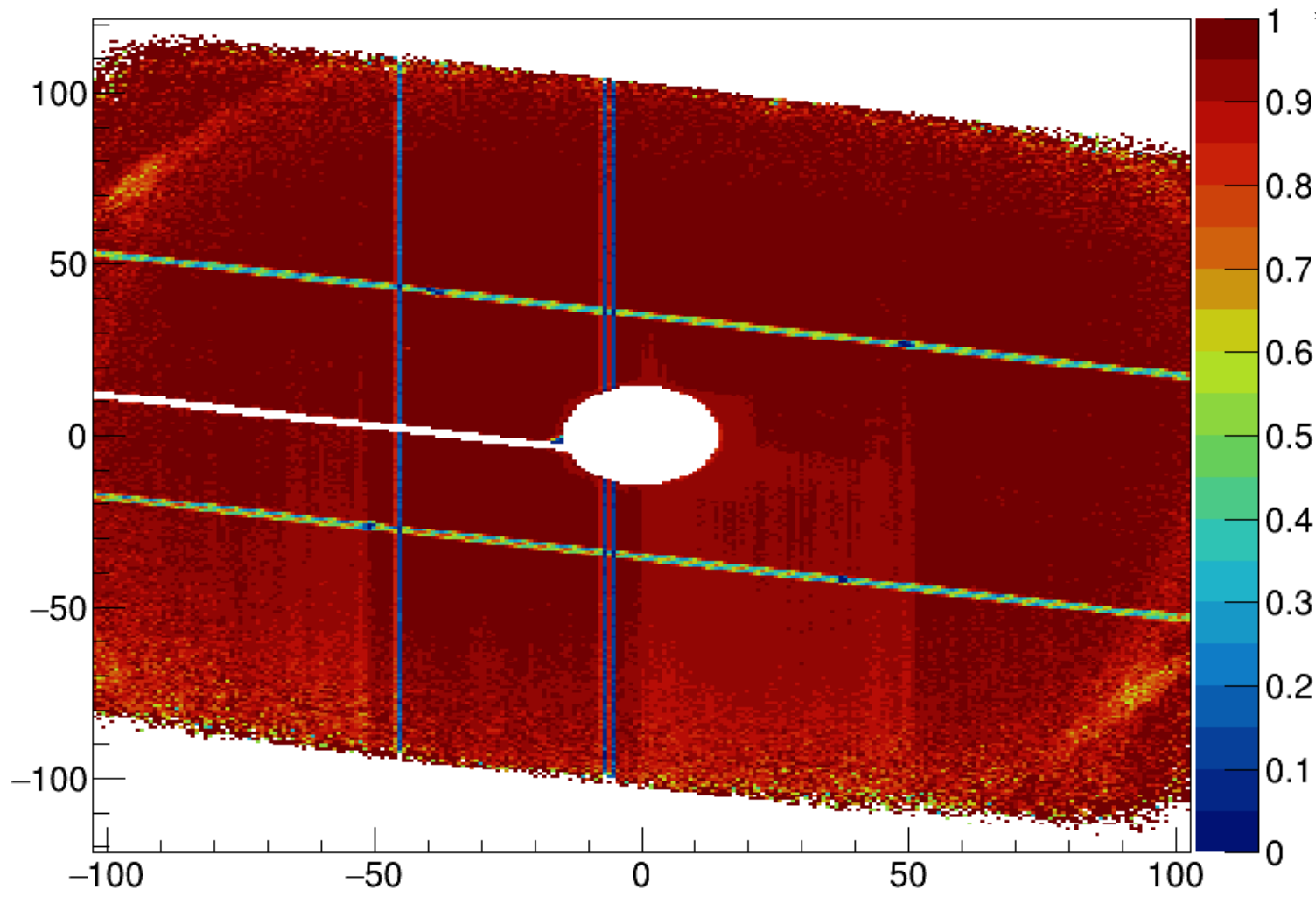
P05t1

DC04V2__ : Eff. = 0.93636 ± 0.00011

Entries 1.62594e+08

DC04V2__ eff = 0.949373
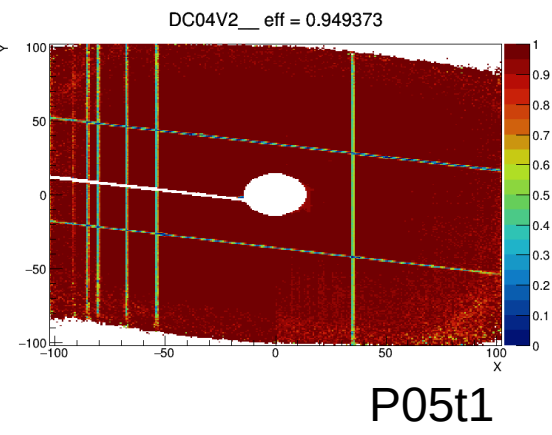
P05t1

DC04X1__ : Eff. = 0.90945 ± 0.00011

Entries   1.606881e+08

DC04X1__ eff = 0.968969
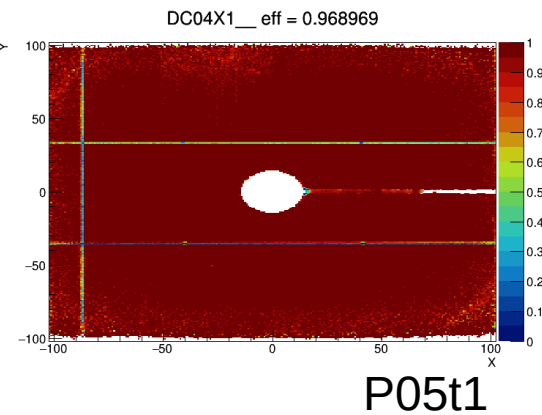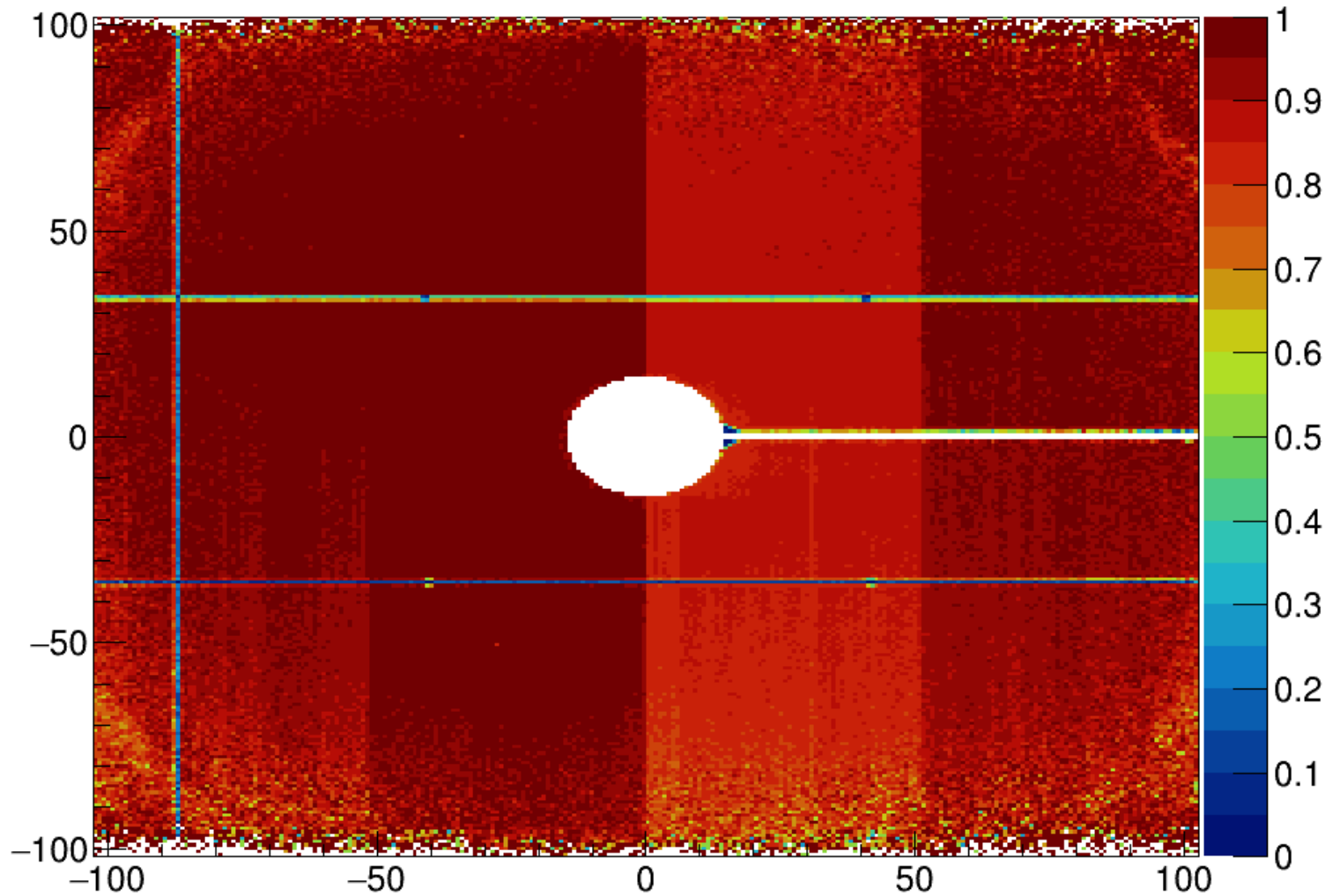
P05t1

DC04X2__ : Eff. = 0.92755 ± 0.00011

Entries 1.606467e+08
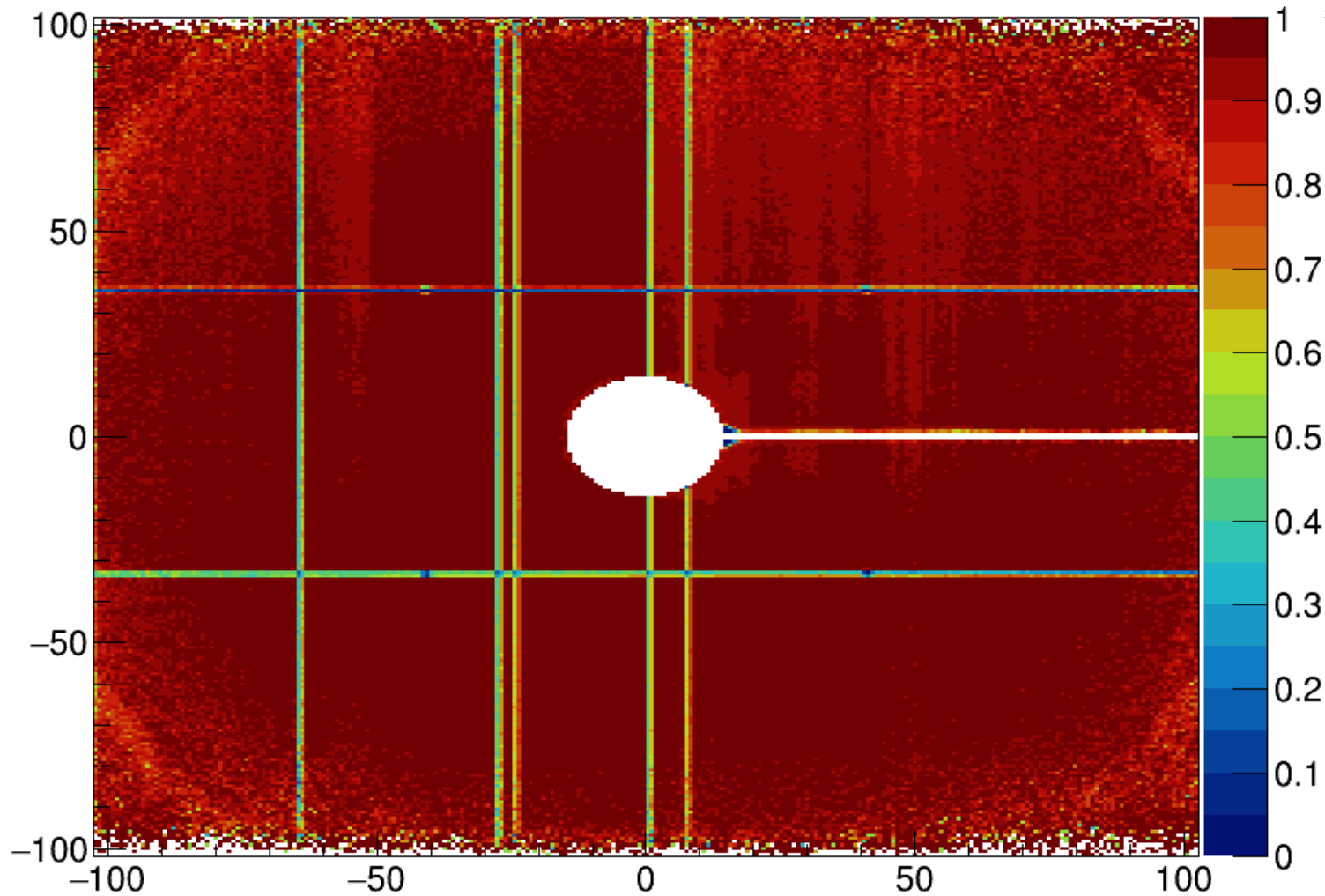
DC04X2__ eff = 0.958972
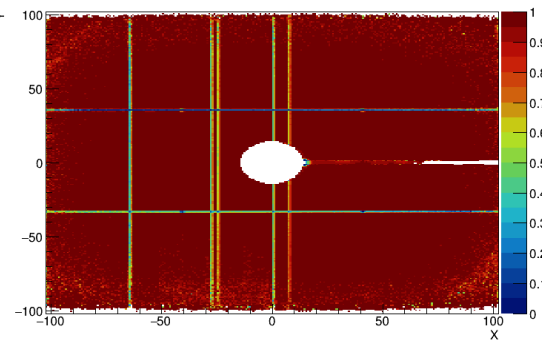
P05t1

DC04Y1__ : Eff. = 0.92294 ± 0.00011

Entries 1.596007e+08

DC04Y1__ eff = 0.963439
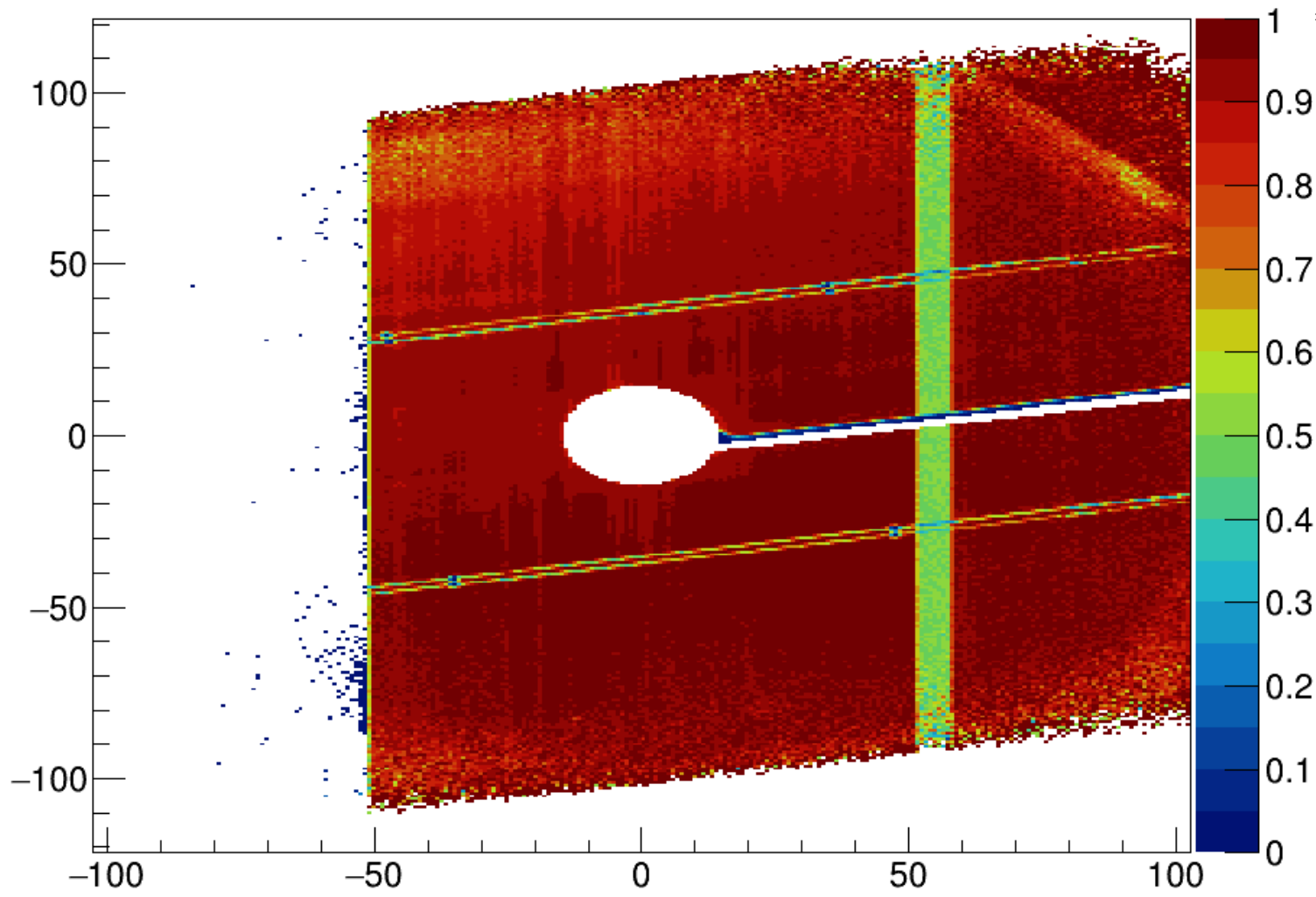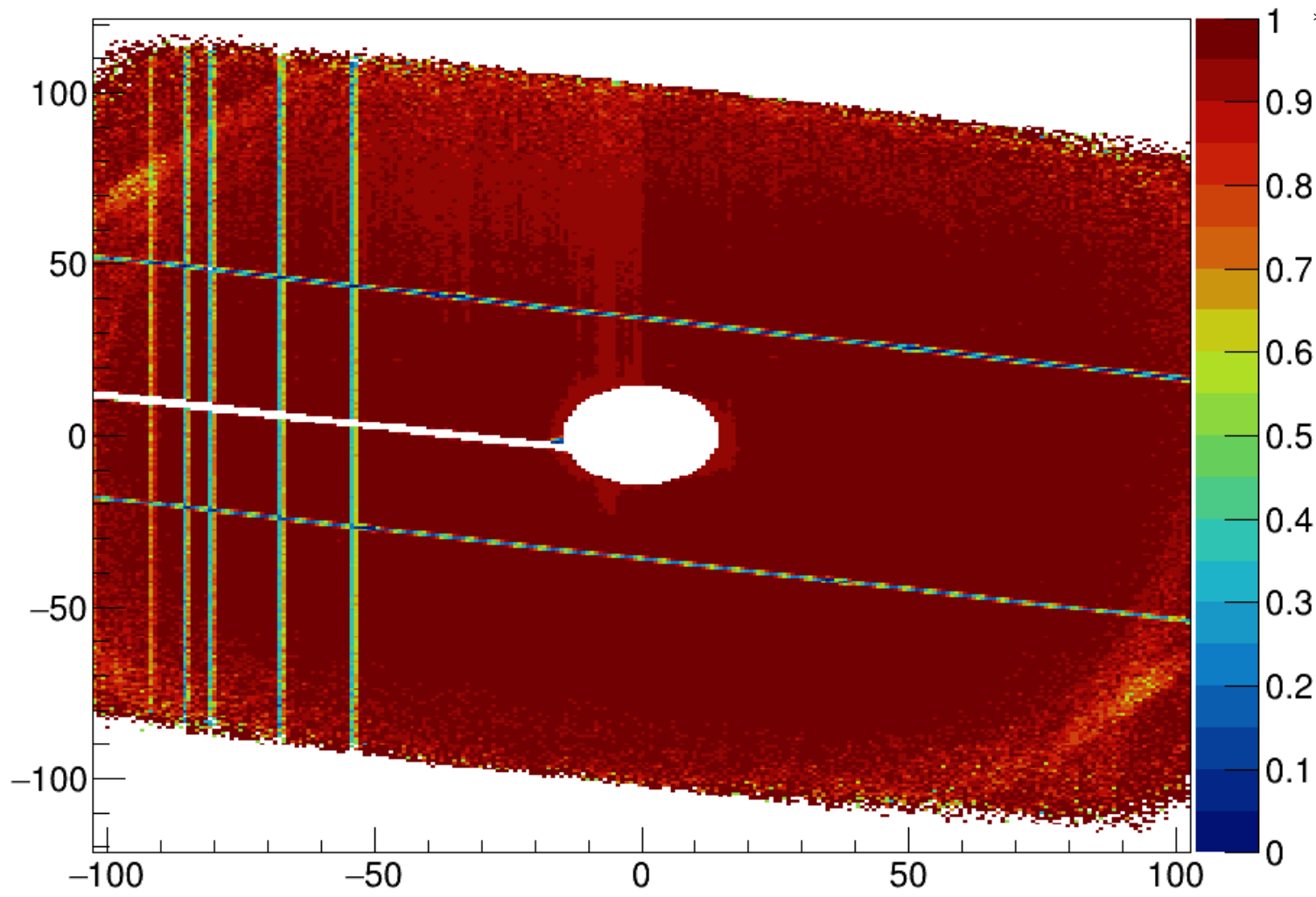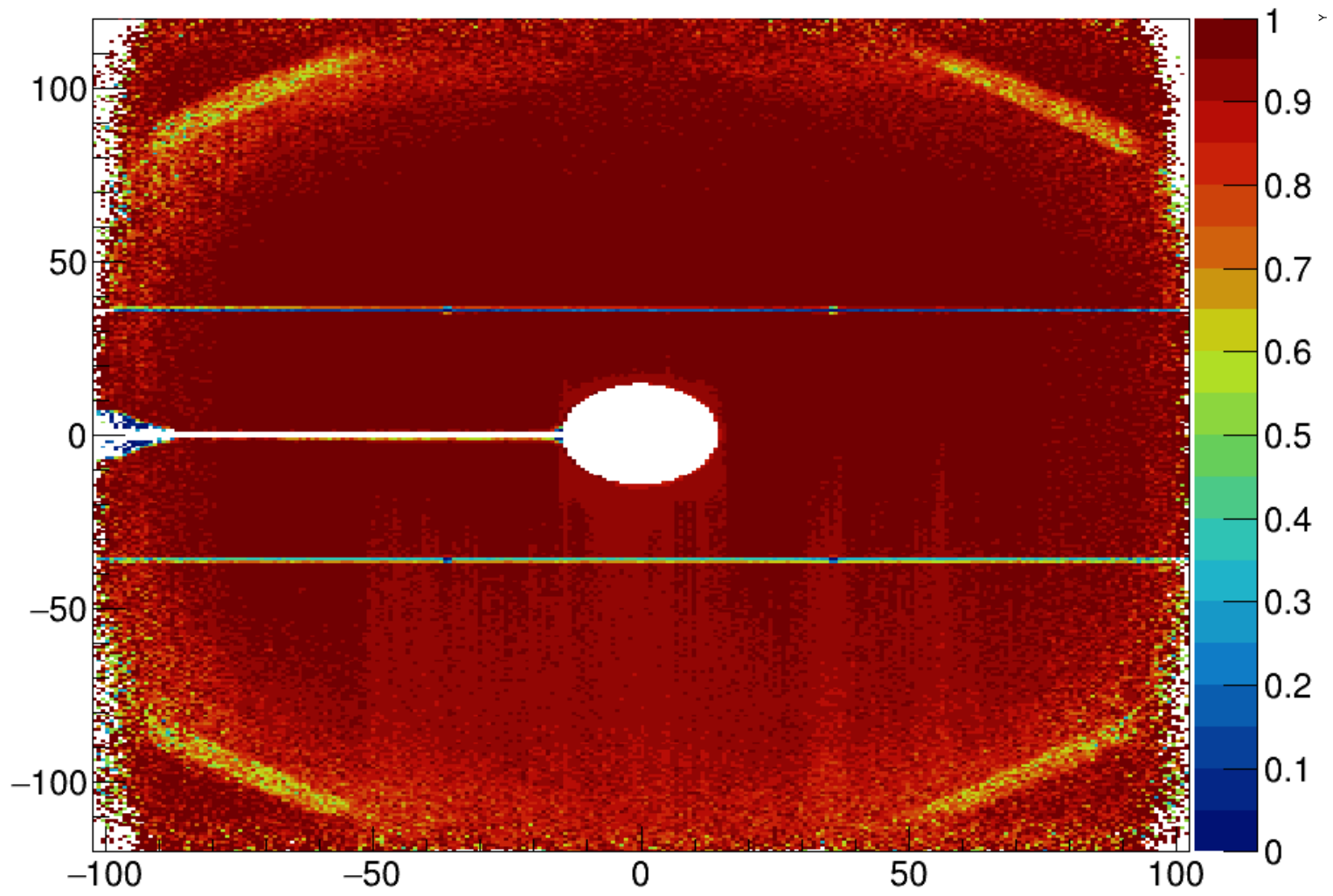
P05t1

DC04Y2__ : Eff. = 0.93405 ± 0.00011

Entries   1.5955e+08
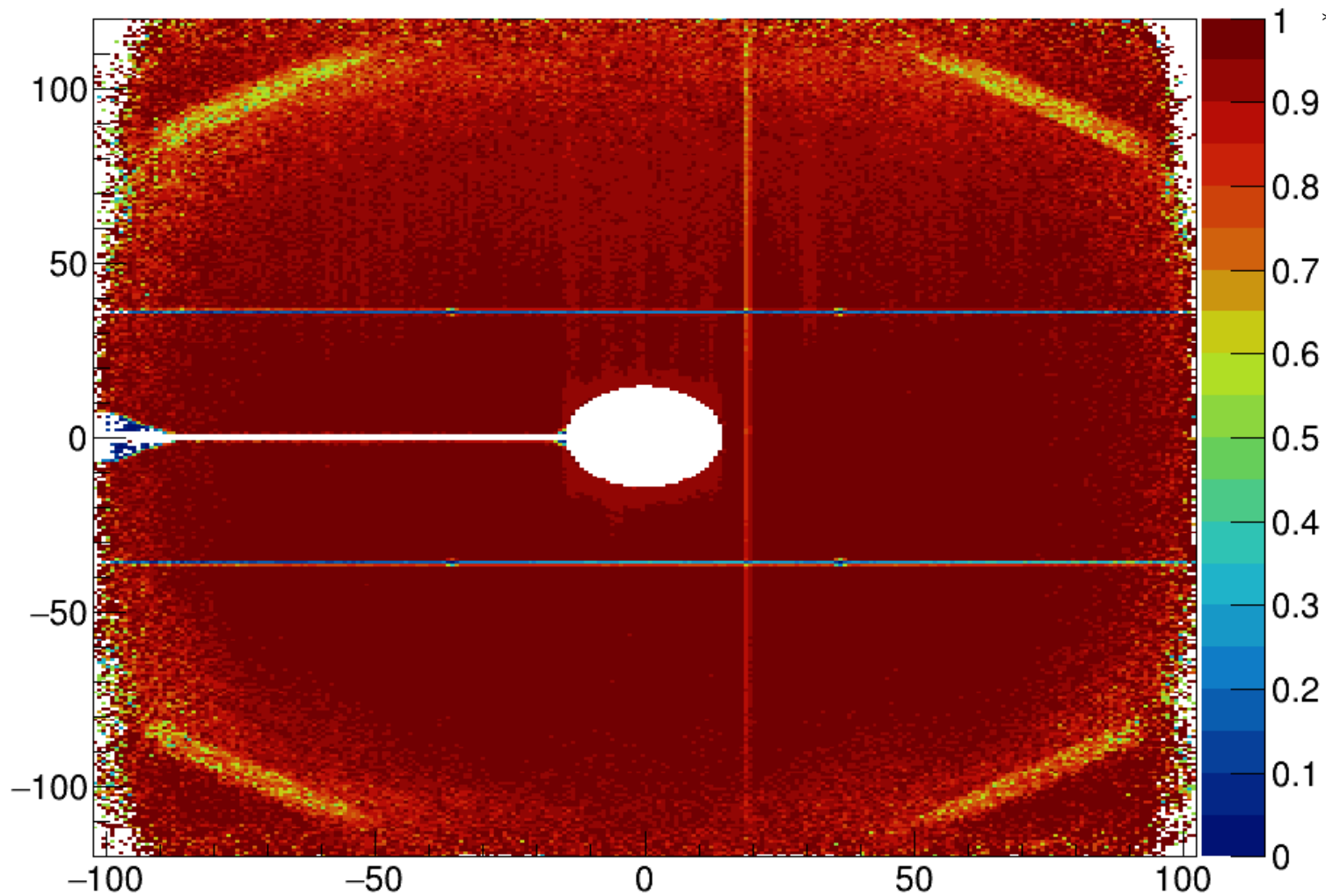
DC04Y2__ eff = 0.970239
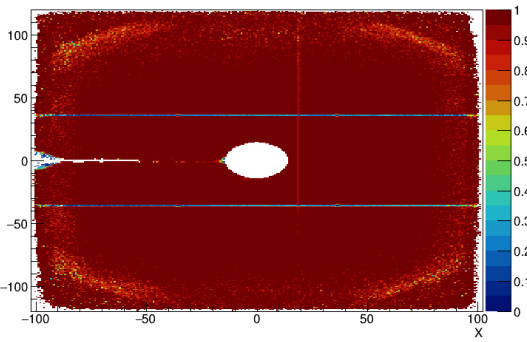
P05t1

DC05U1__ : Eff. = 0.79292 ± 0.00011

Entries   1.69076e+08

DC05U1__ eff = 0.883515
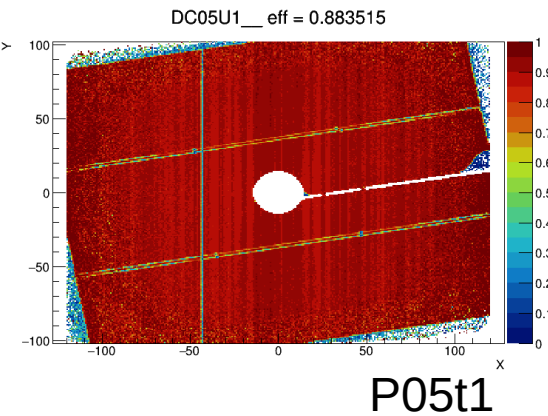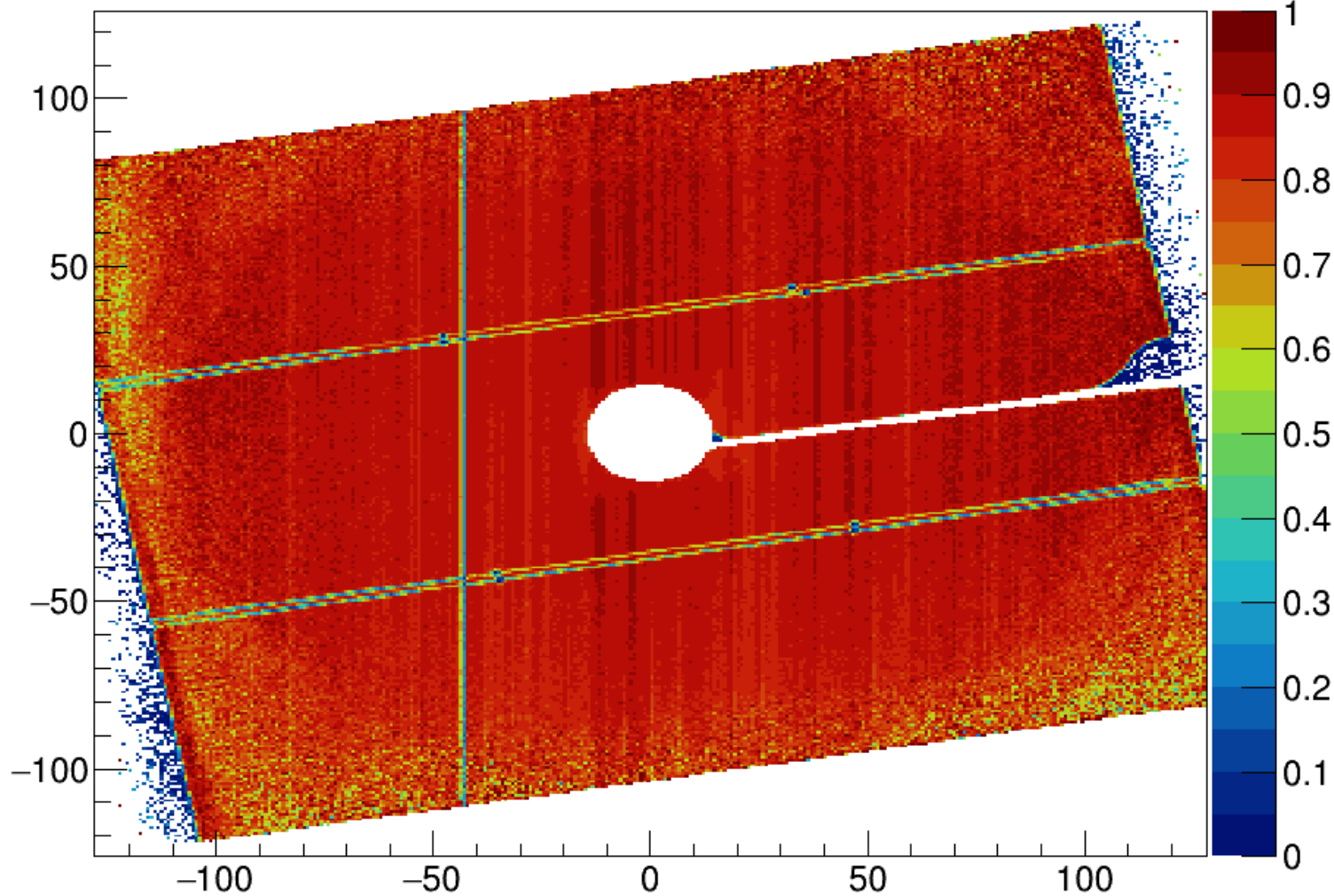
P05t1

DC05U2__ : Eff. = 0.79654 ± 0.00011

Entries 1.690465e+08

DC05U2__ eff = 0.890648
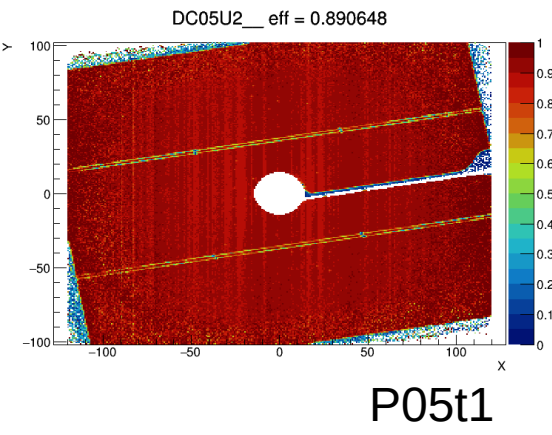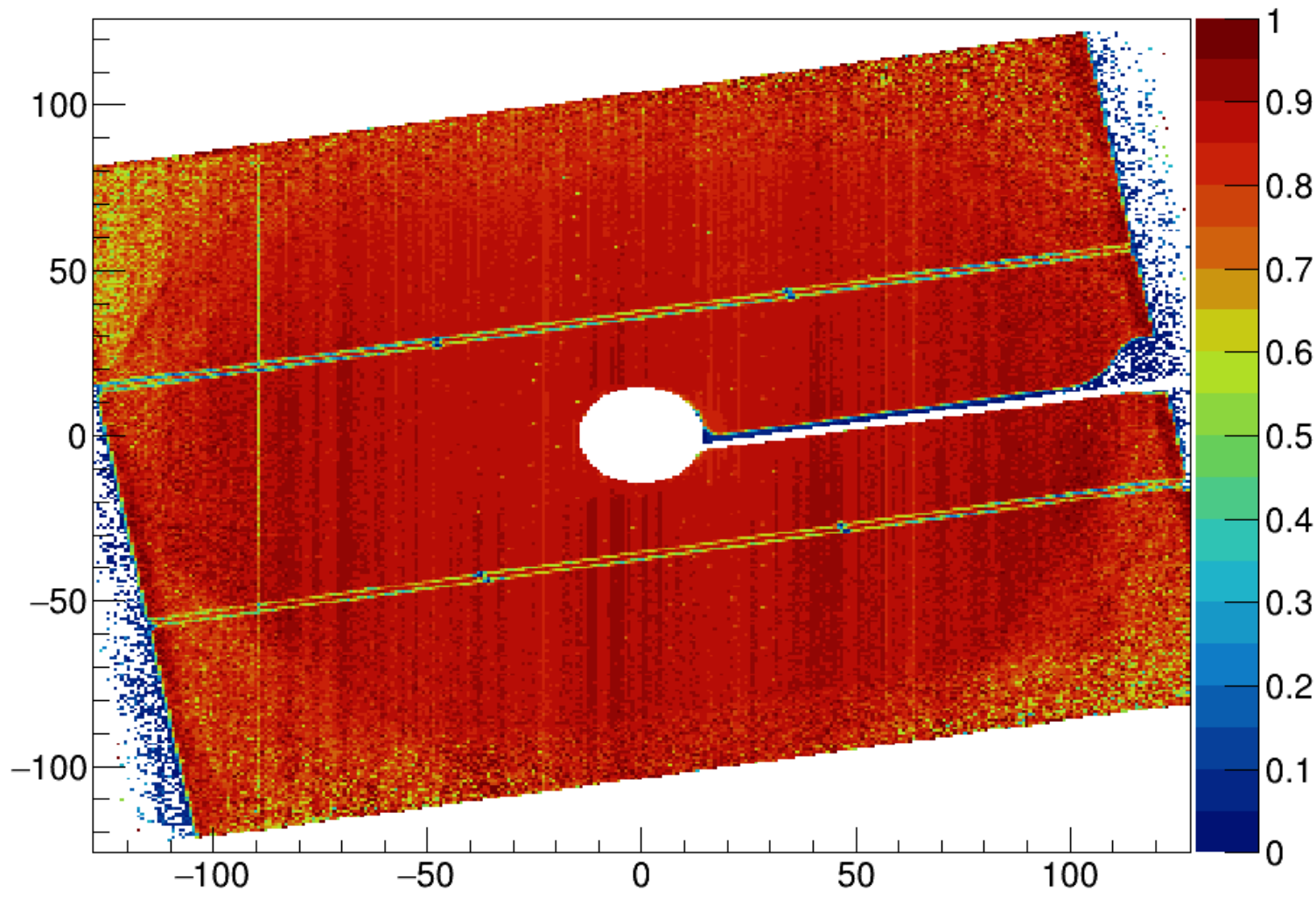
P05t1

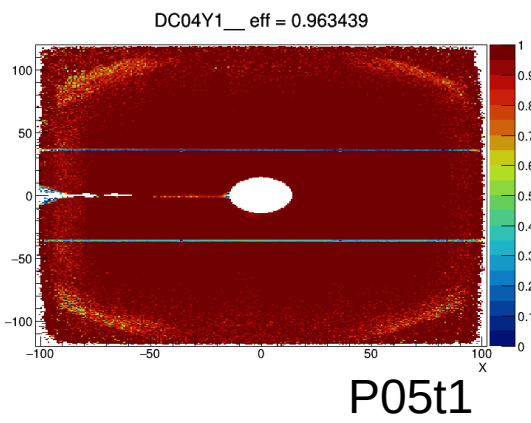**DC05V1__ : Eff. = 0.78872 ± 0.00012**

Entries   1.56971e+08

DC05V1__ eff = 0.883219
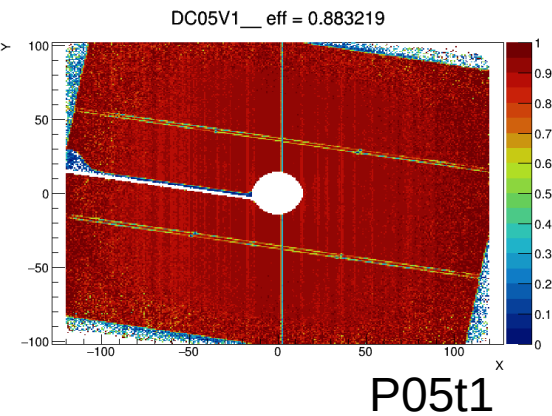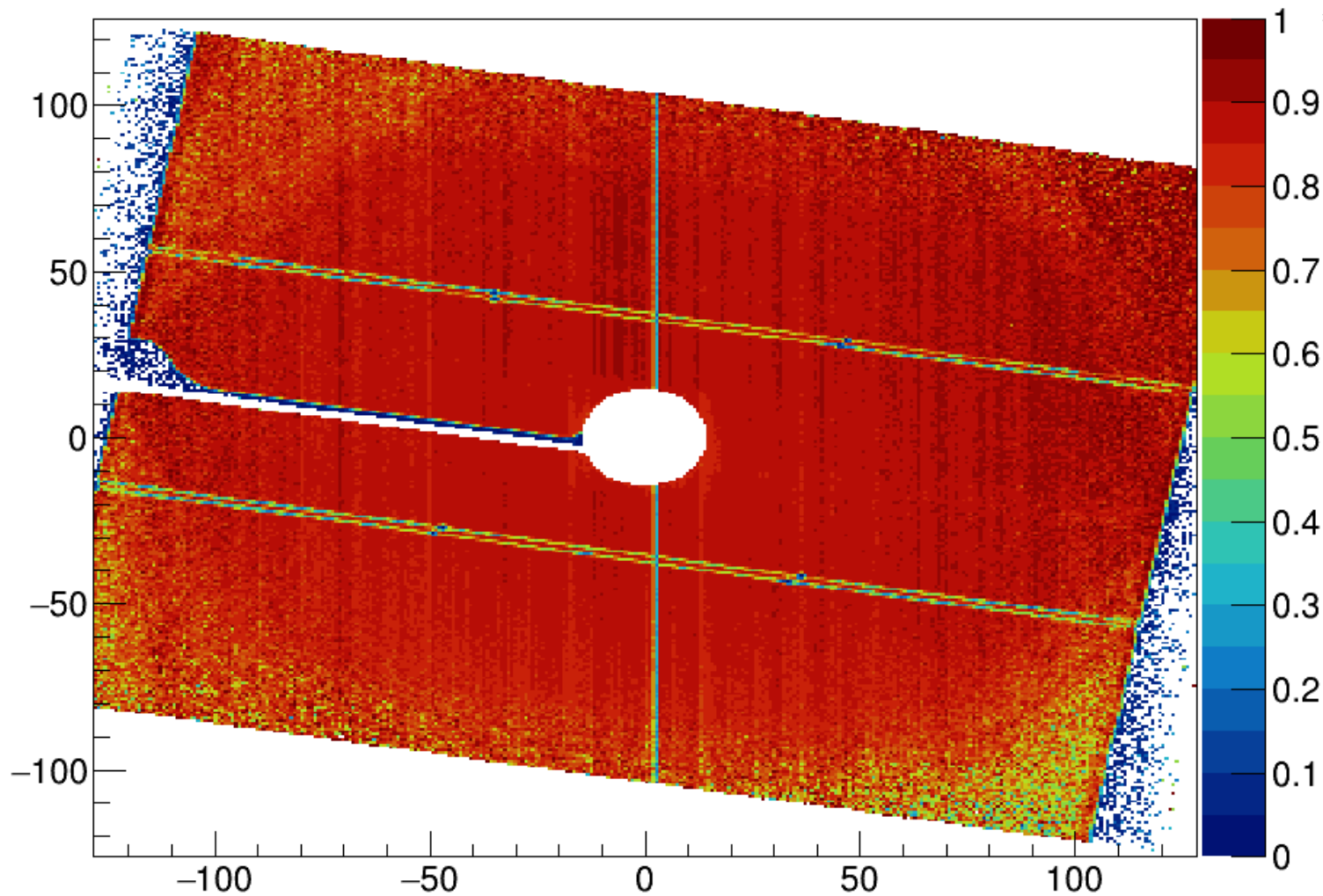
P05t1

DC05V2__ : Eff. = 0.79191 ± 0.00012

Entries   1.569445e+08

DC05V2__ eff = 0.885656
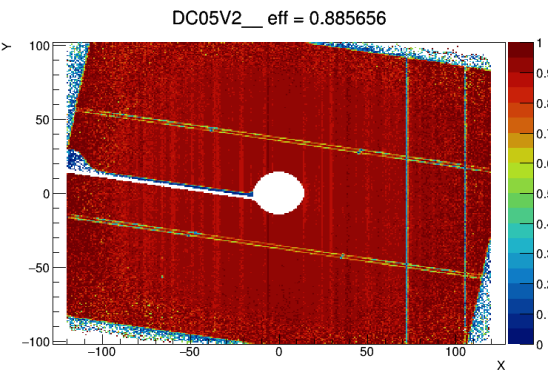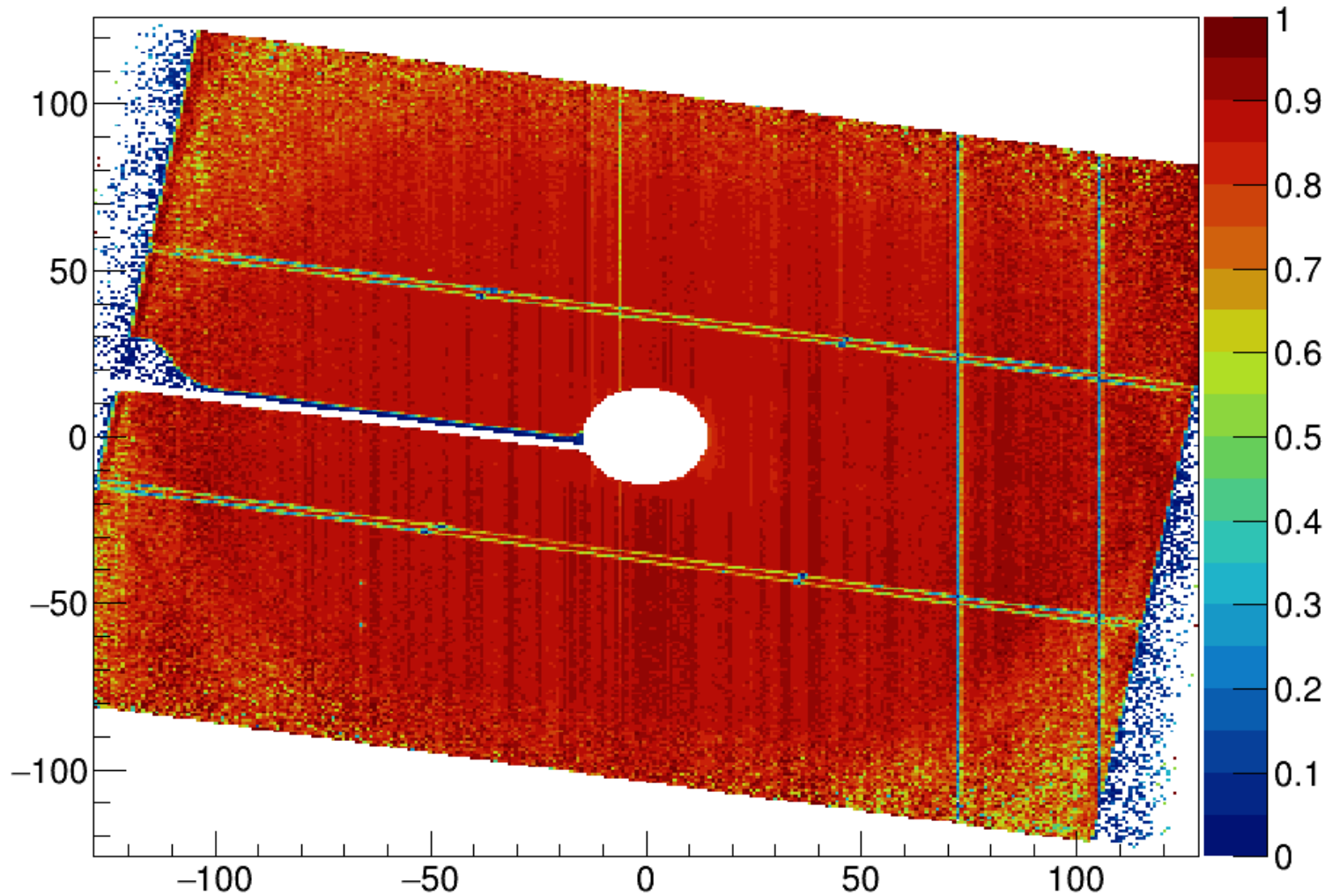
P05t1

DC05X1__ : Eff. = 0.86302 ± 0.00012

Entries   1.5791e+08
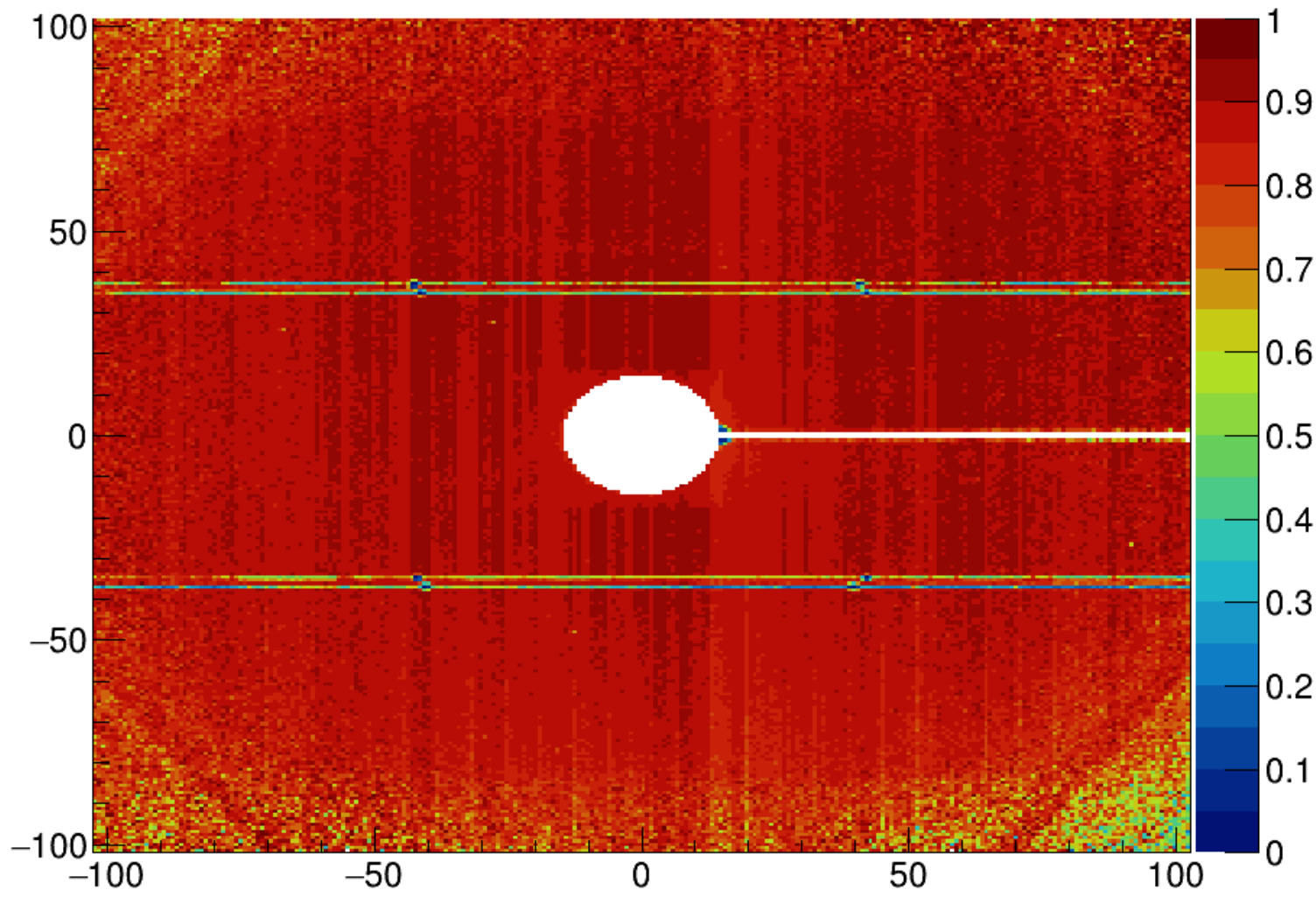
Absent in P05t1

DC05X2__ : Eff. = 0.84731 ± 0.00012

Entries 1.577534e+08
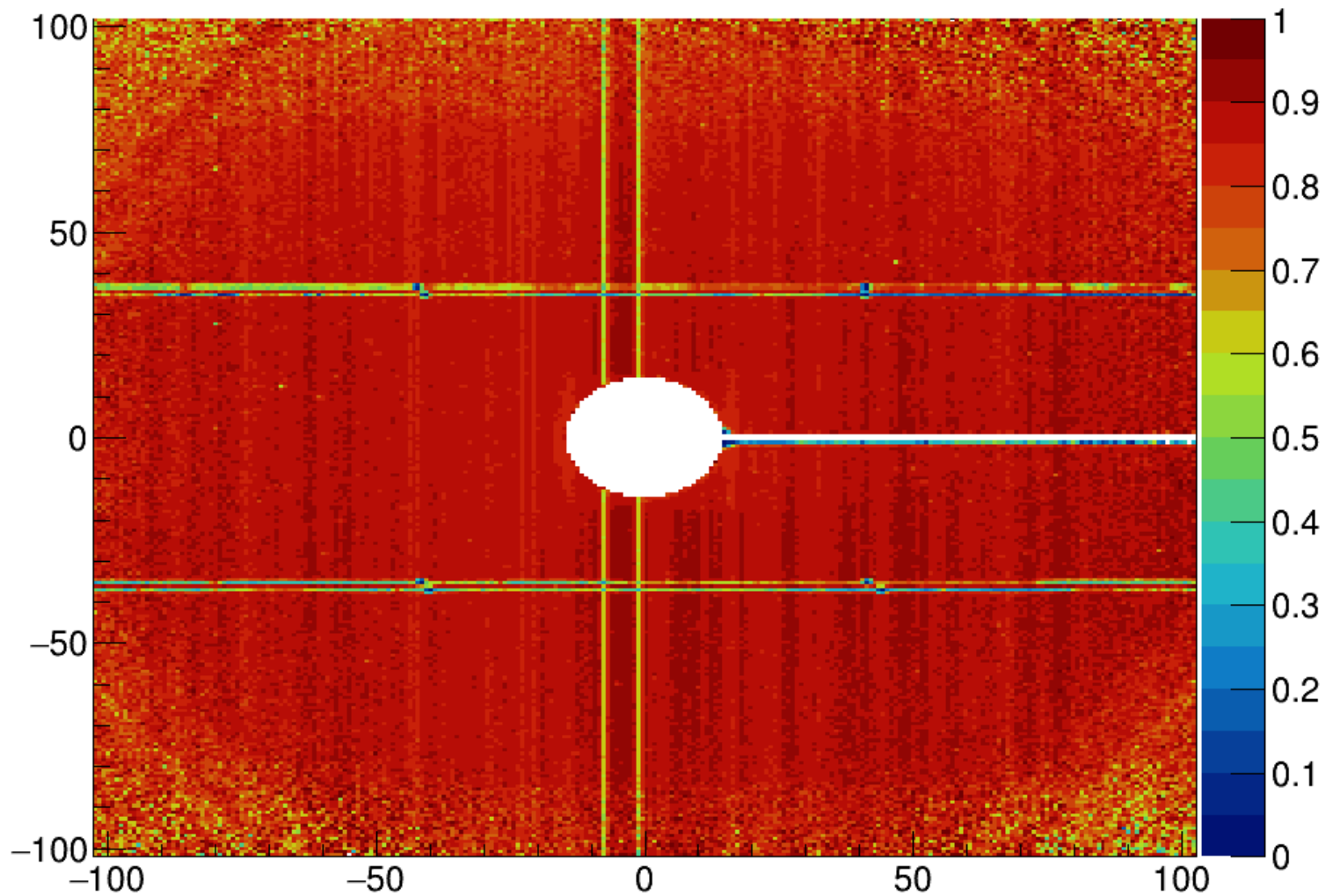
Absent in P05t1

DC05Y1__ : Eff. = 0.85973 ± 0.00012

Entries   1.593755e+08

DC05Y1__ eff = 0.904596
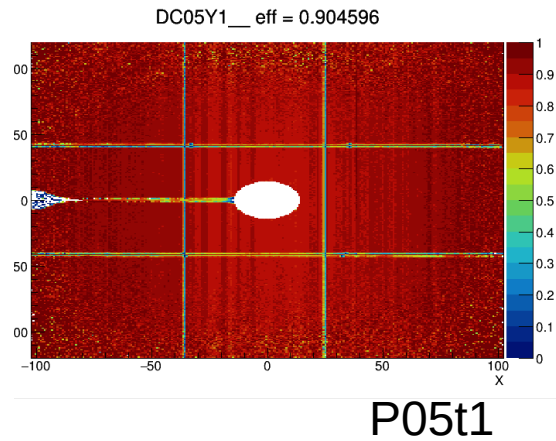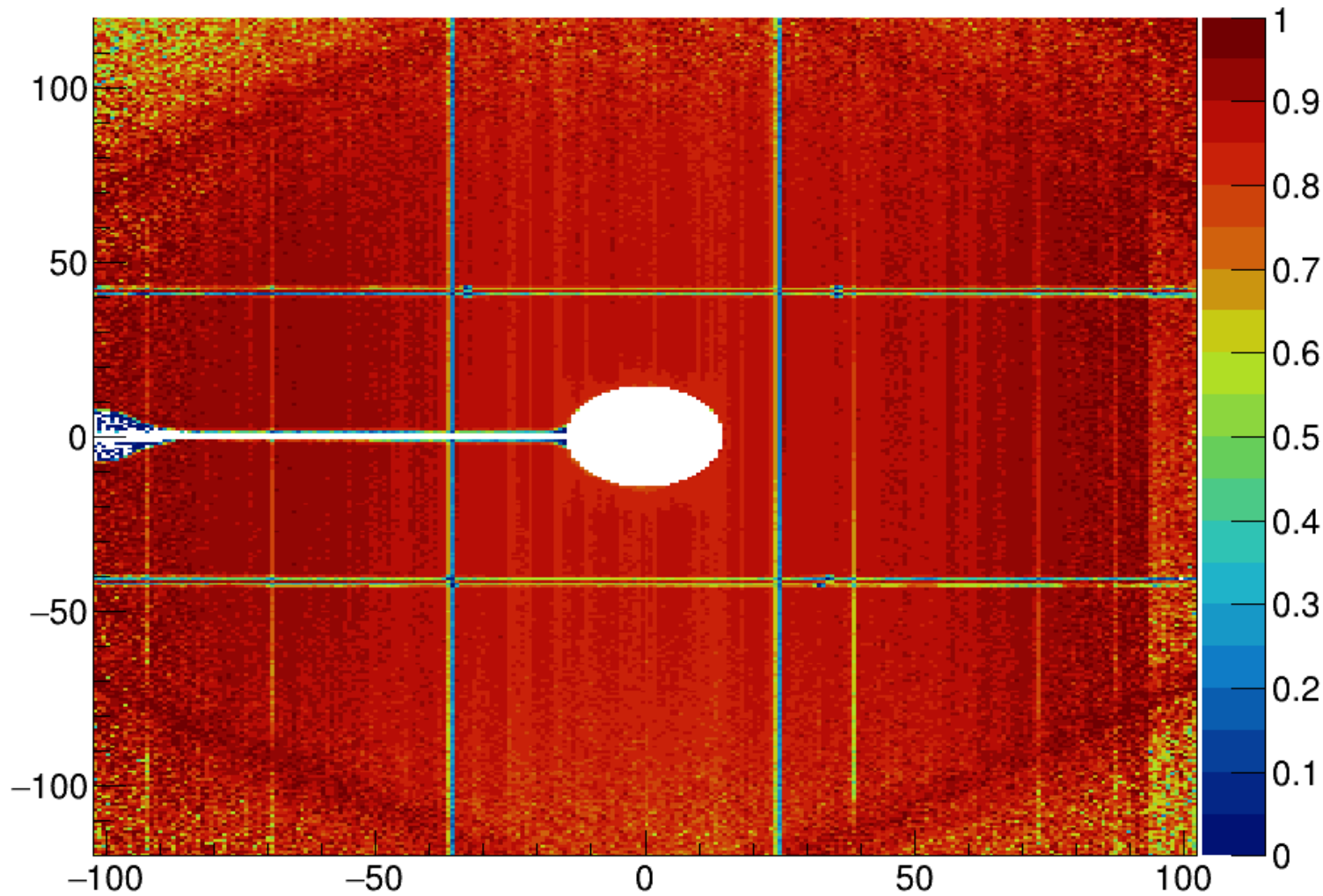
P05t1

DC05Y2__ : Eff. = 0.03545 ± 0.00042

Entries   1.593465e+08
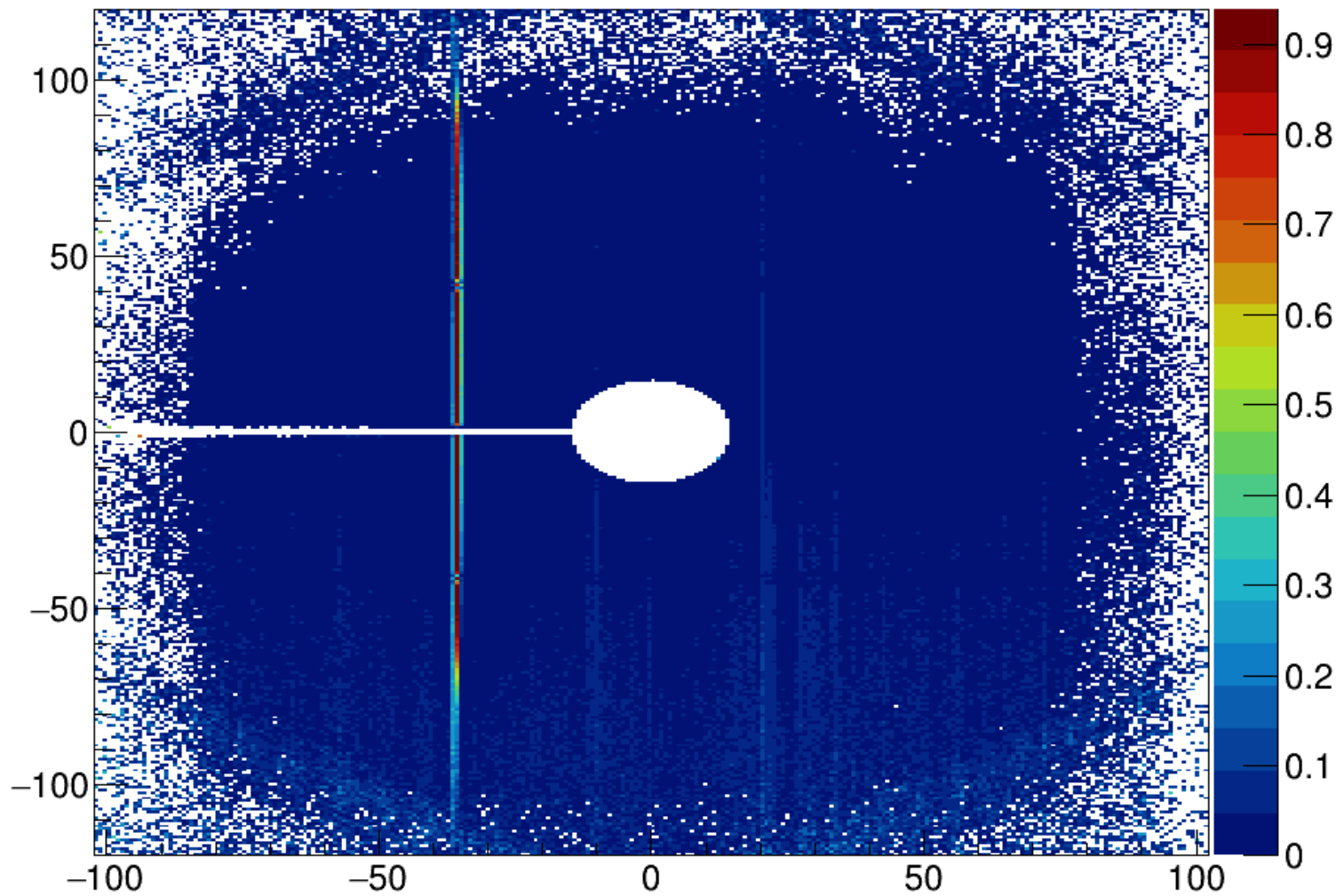
DC05Y2__ eff = 0.091480
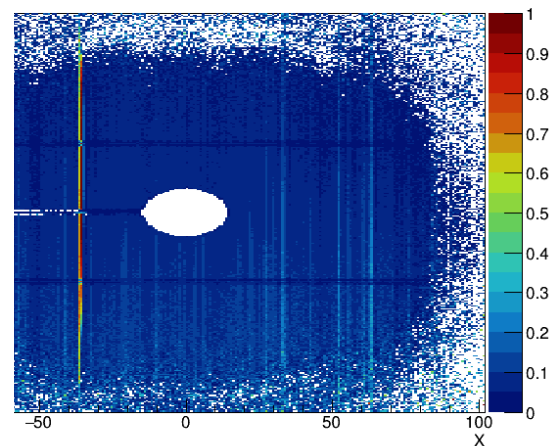
P05t1

DR01X1___ : Eff. = 0.70997 ± 0.00015

Entries   1.11934e+08

DR01X1___ eff = 0.783697
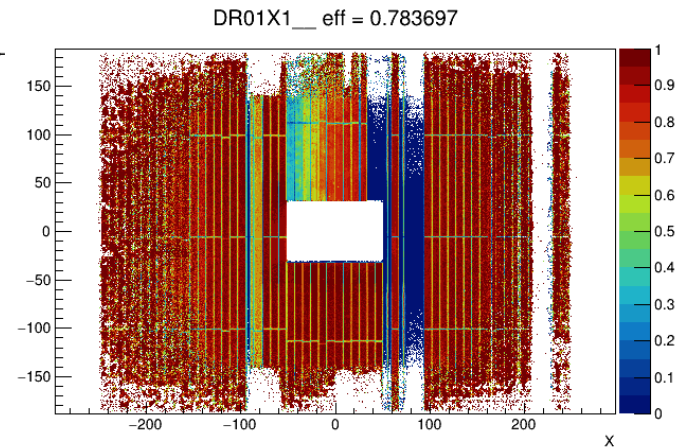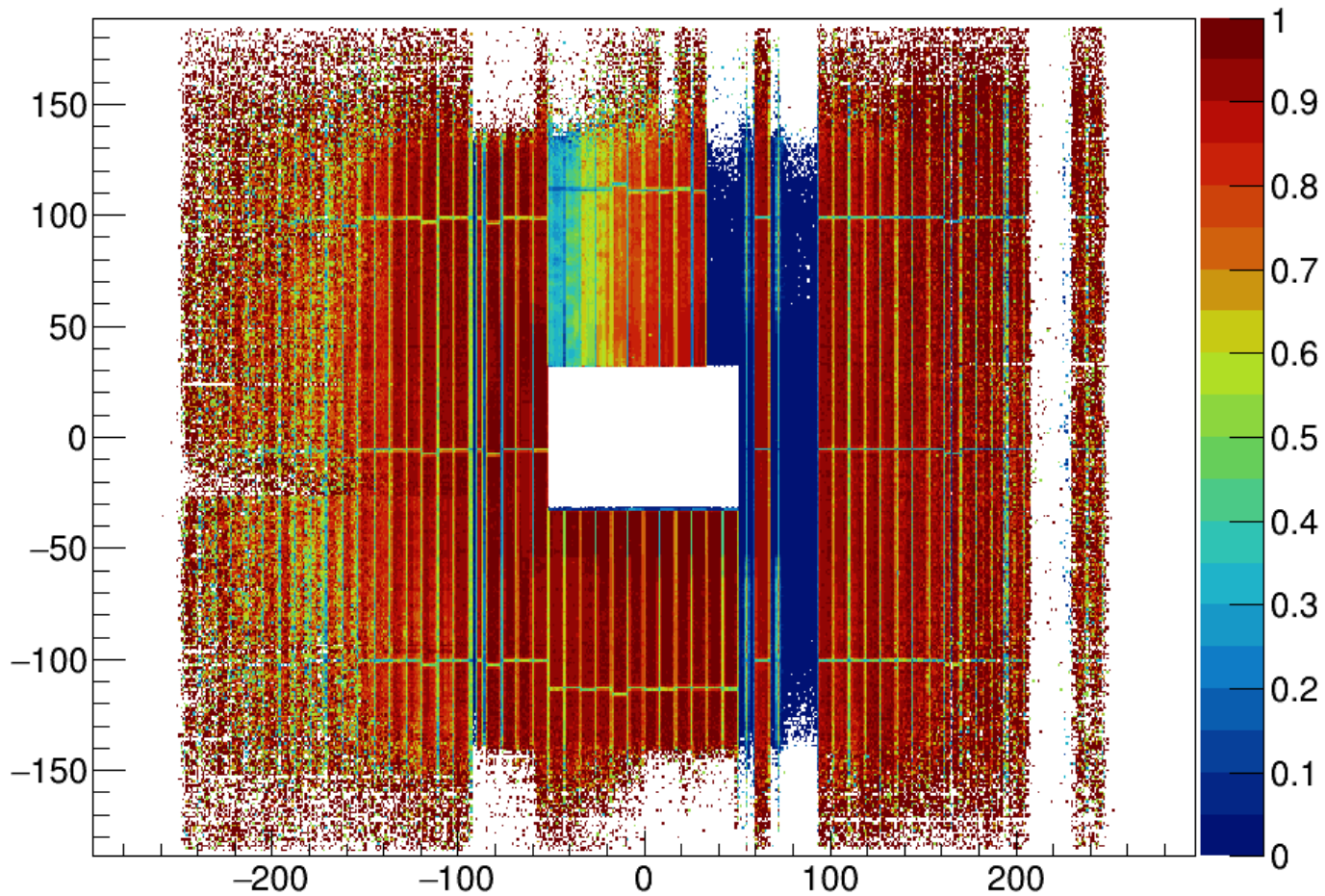
DR01X2__ : Eff. = 0.61525 ± 0.00015

Entries   1.128227e+08

DR01X2__ eff = 0.772699
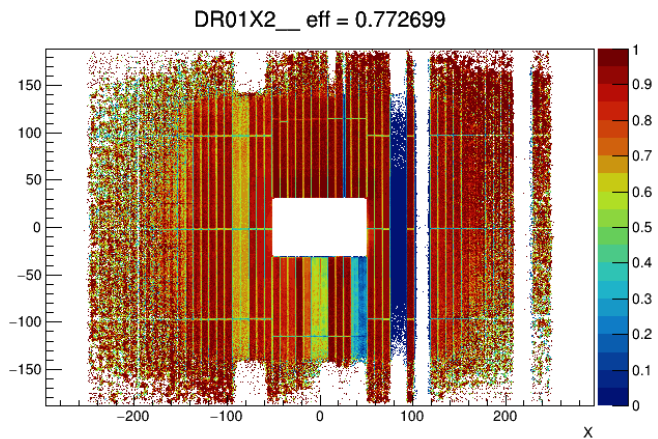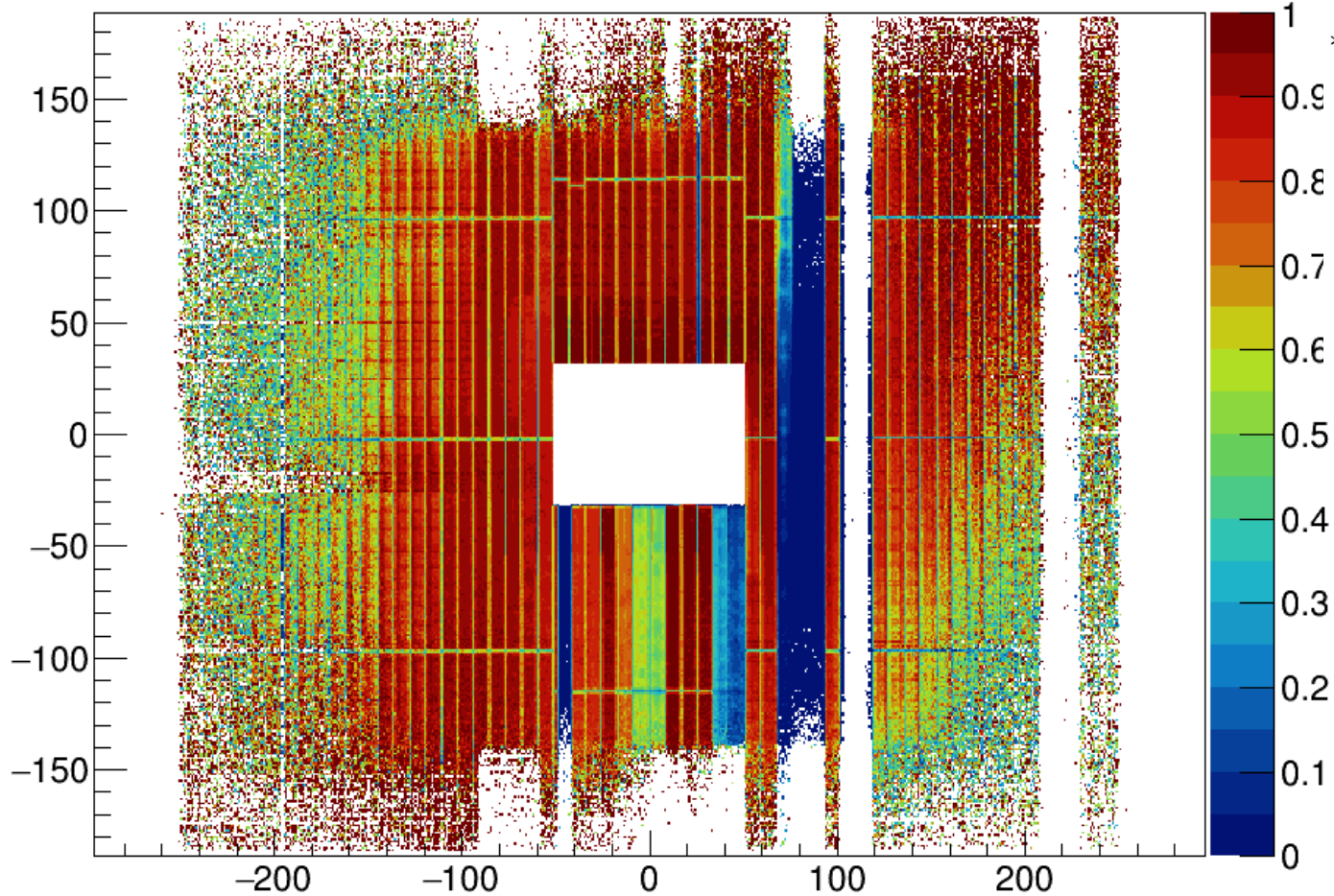
DR01Y1__ : Eff. = 0.84180 ± 0.00014

Entries   1.127327e+08
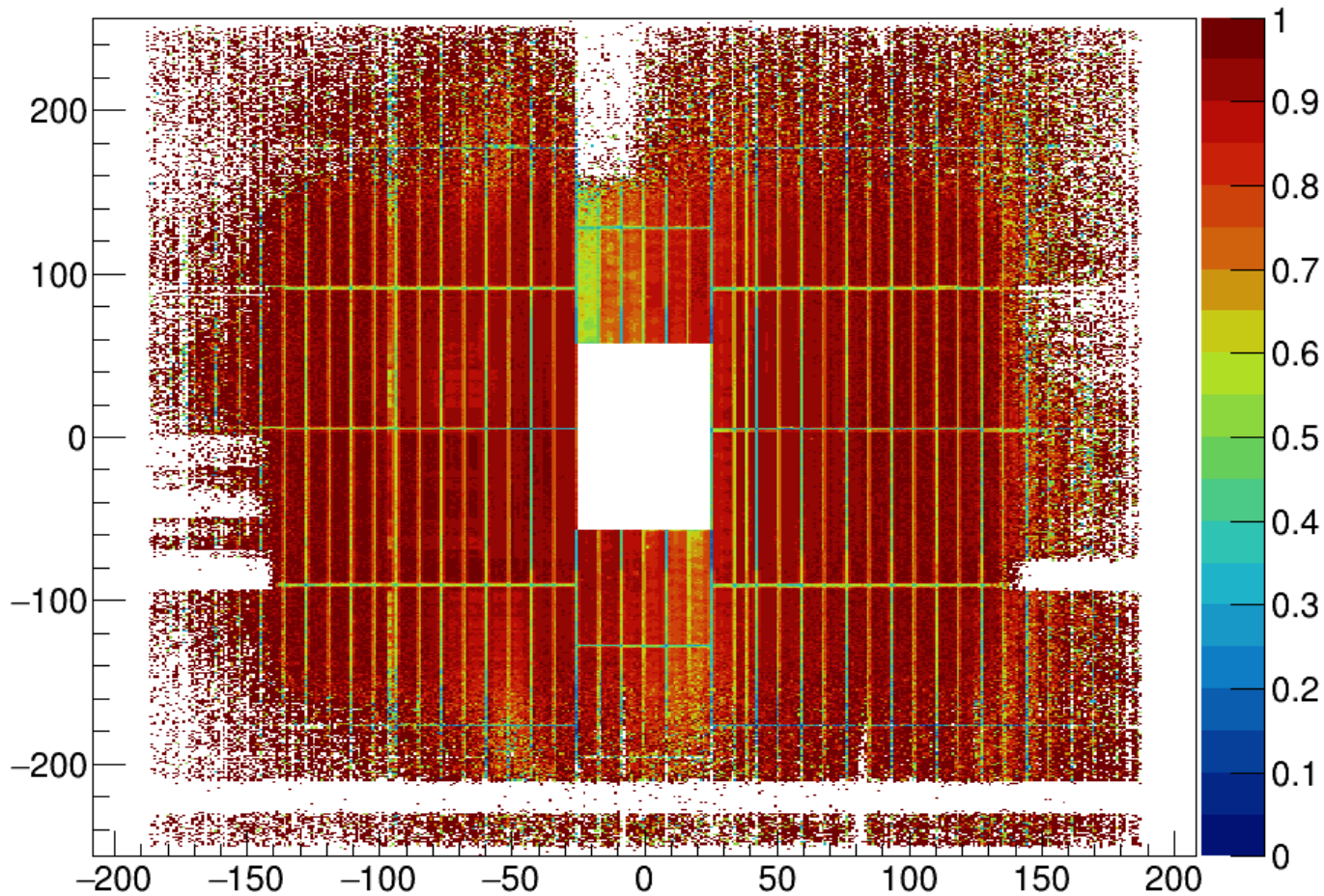
DR01Y1__ eff = 0.867777
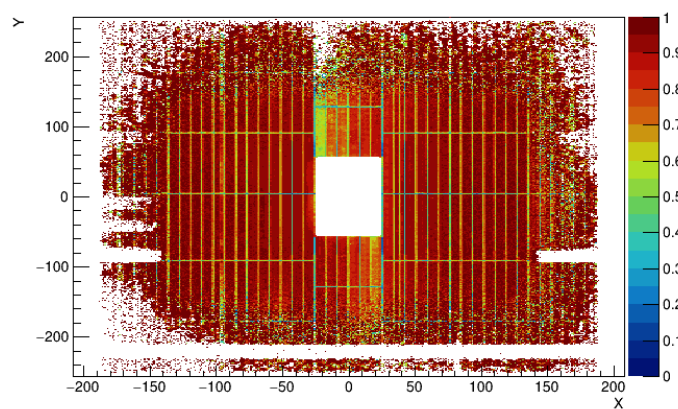
DR01Y2__ : Eff. = 0.84009 ± 0.00014

Entries   1.129357e+08
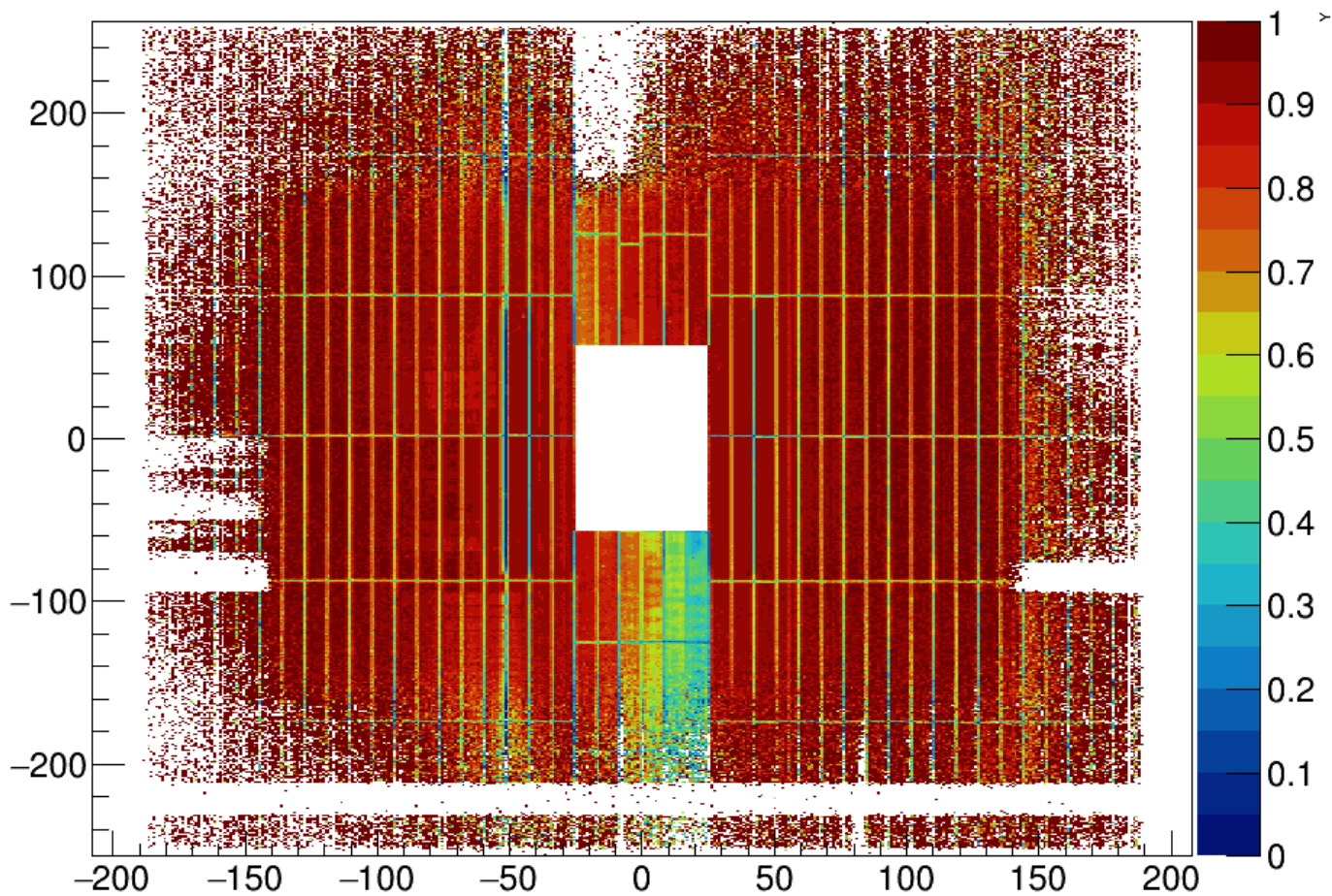
DR01Y2__ eff = 0.867308
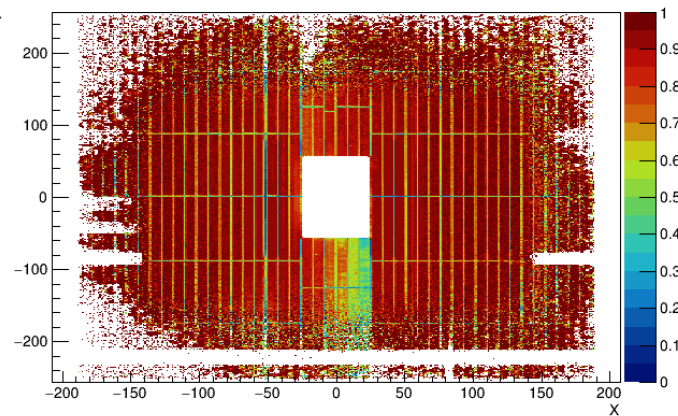
DR02X1__ : Eff. = 0.57539 ± 0.00017

Entries 1.134125e+08

DR02X1__ eff = 0.671473
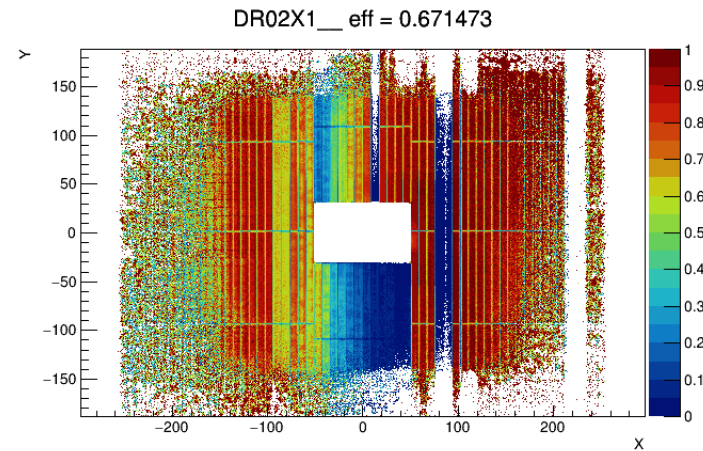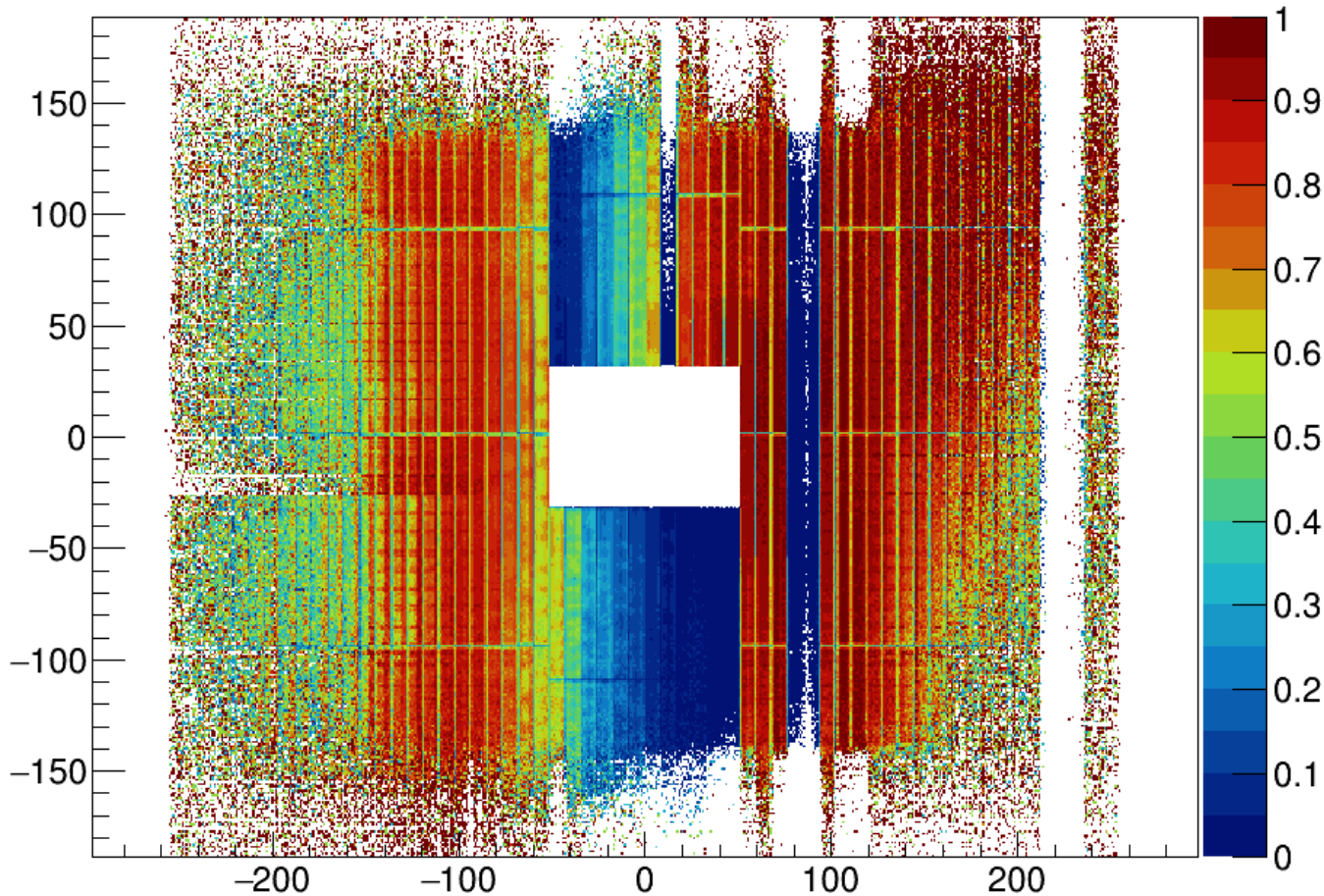
DR02X2__ : Eff. = 0.67498 ± 0.00016

Entries 1.137088e+08
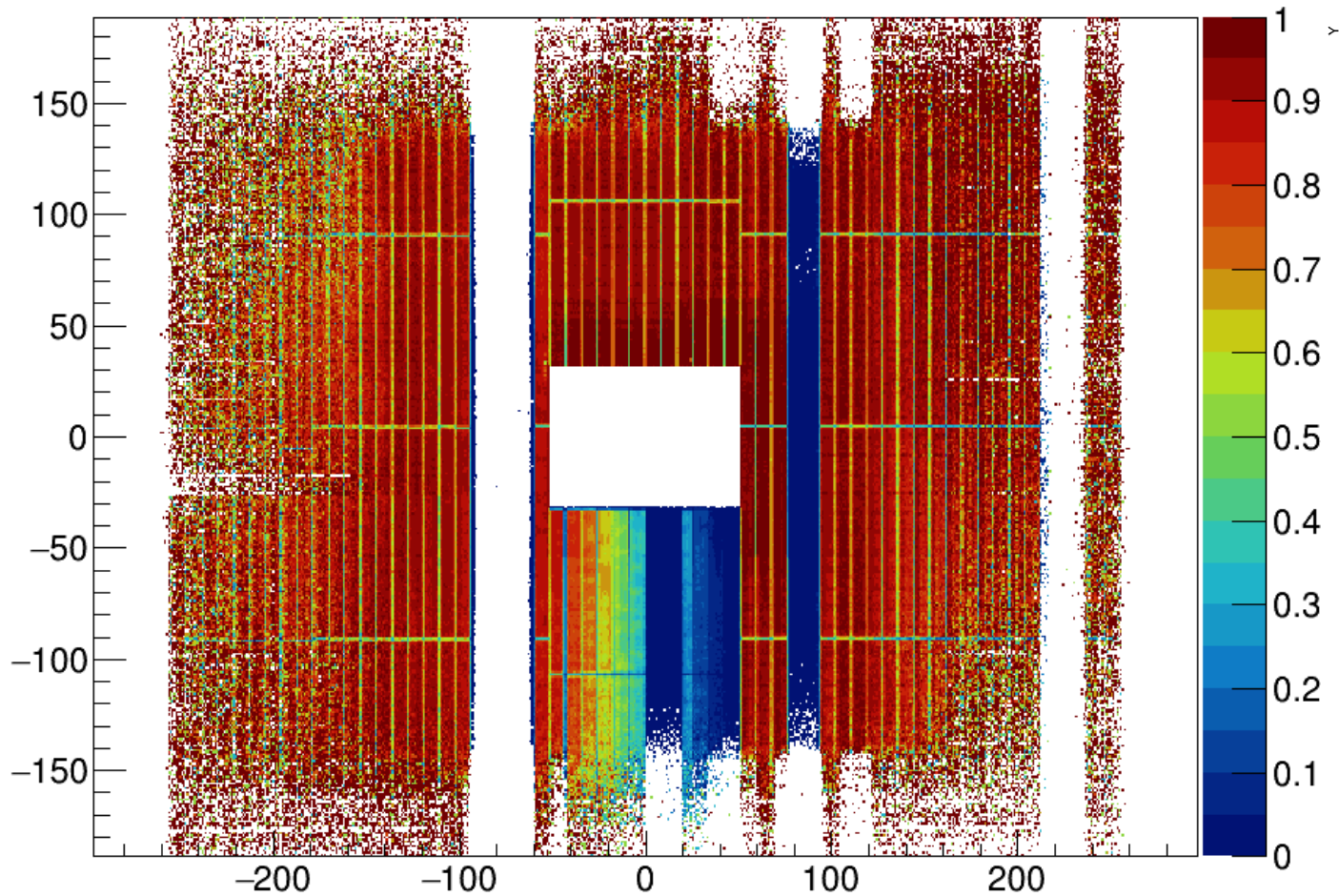
DR02X2___ eff = 0.782130
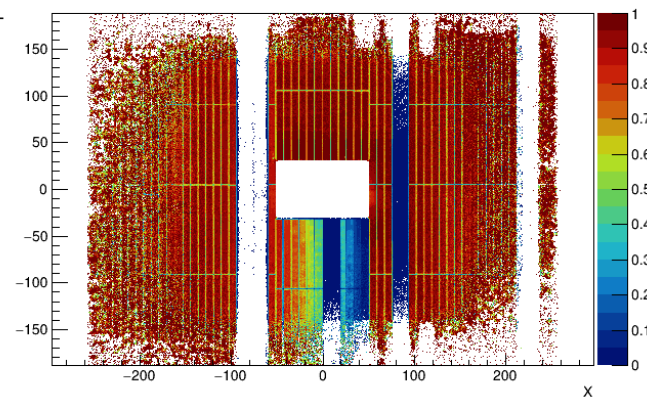
DR02Y1__ : Eff. = 0.82663 ± 0.00014

Entries   1.116436e+08
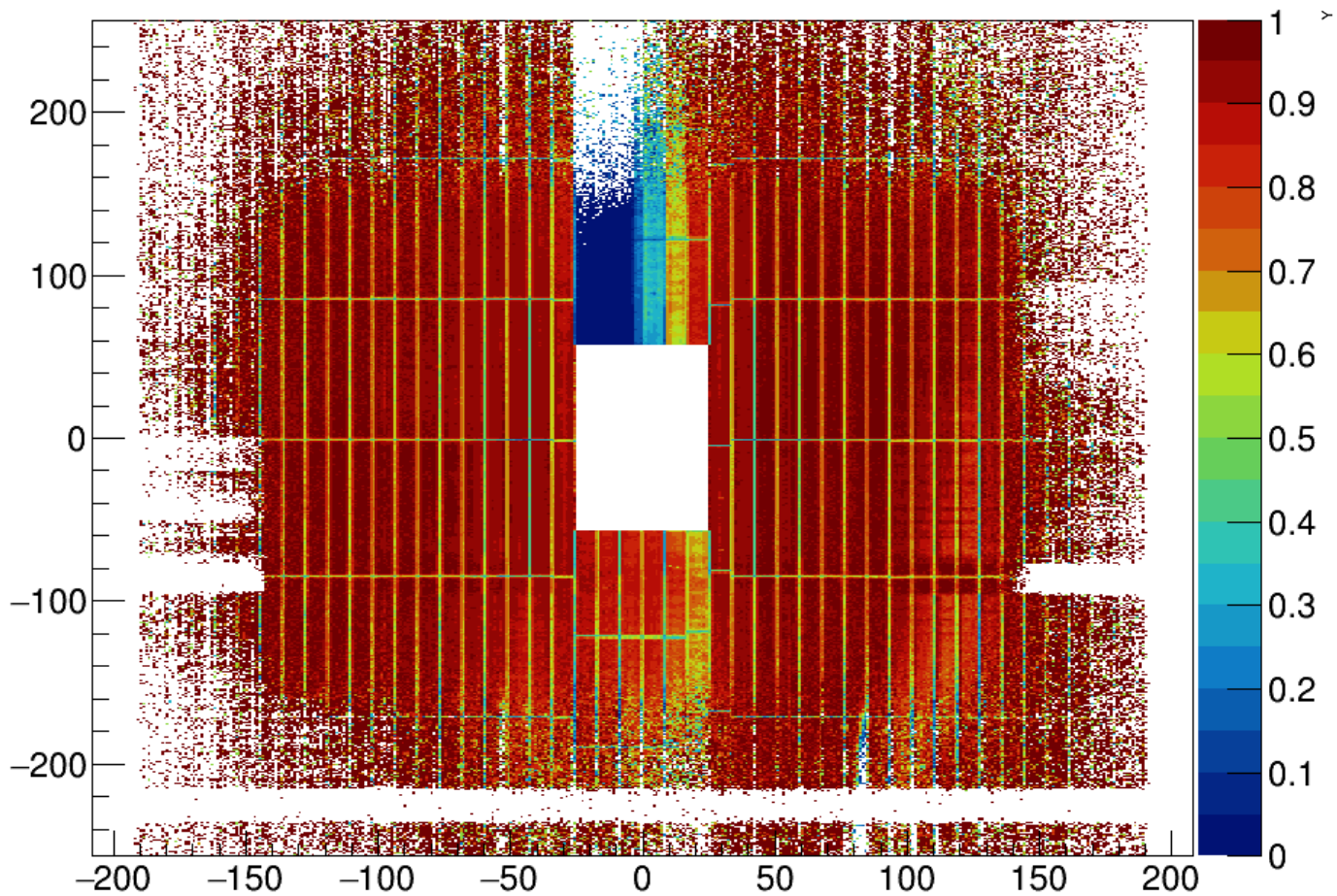
DR02Y1__ eff = 0.869178
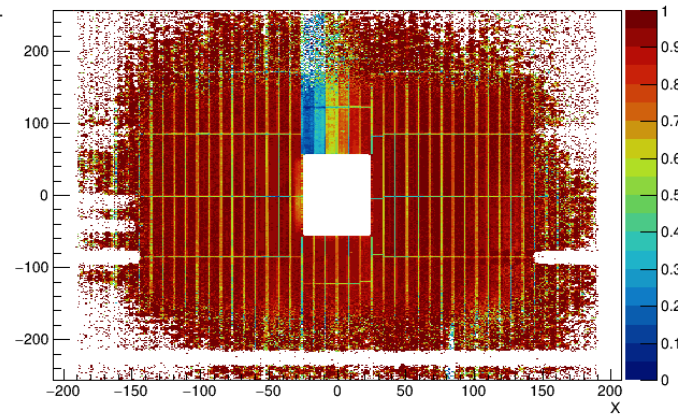
DR02Y2__ : Eff. = 0.84068 ± 0.00014

Entries   1.117982e+08
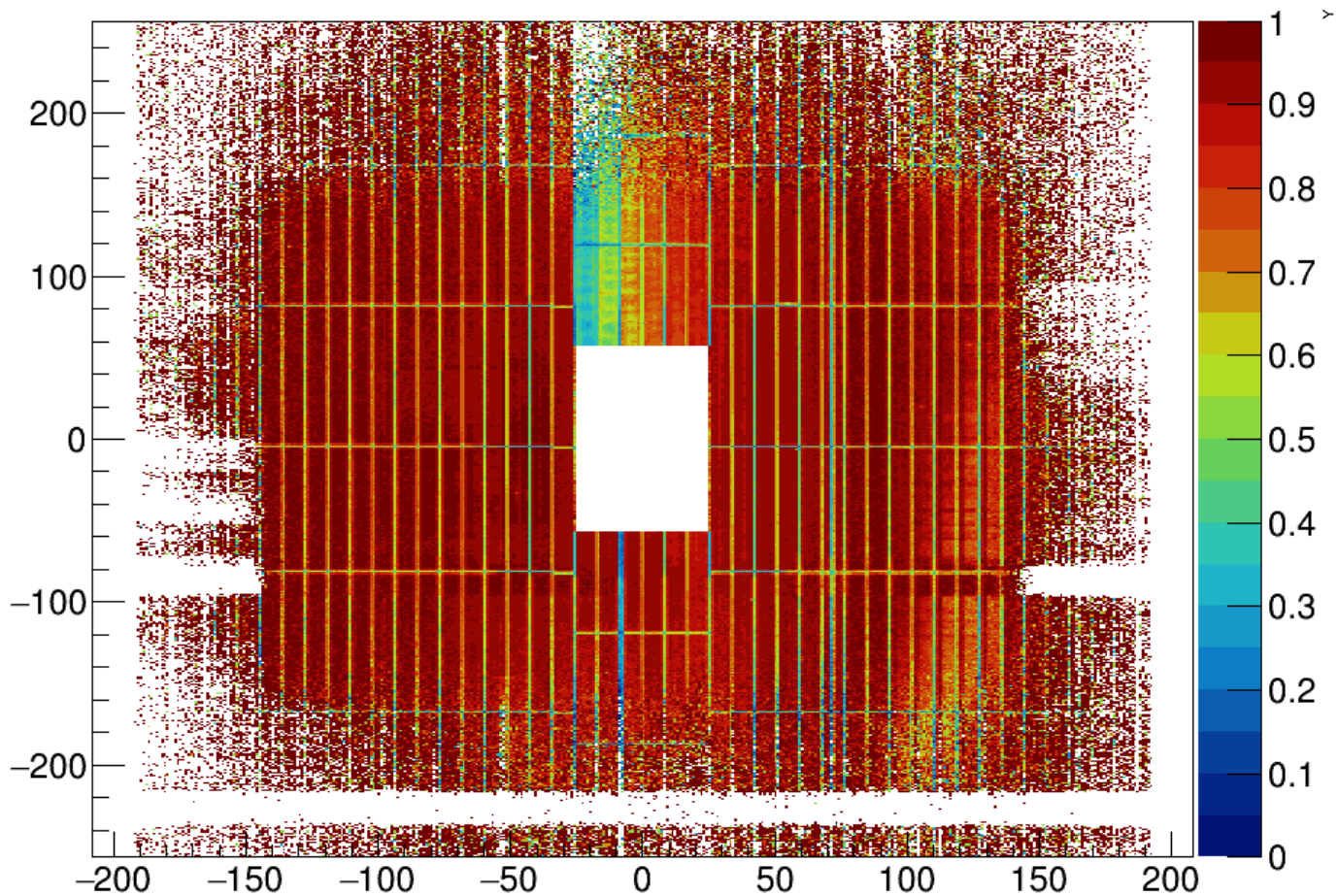
DR02Y2__ eff = 0.868016
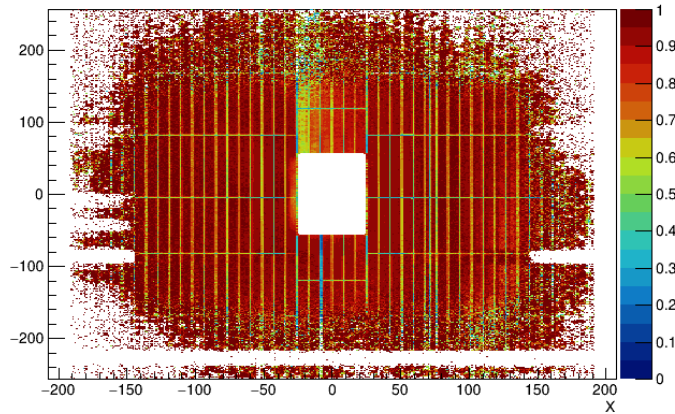
MP01X1__ : Eff. = 95.49 ± 0.01 %

Entries   1.224807e+08

MP01X1__ eff = 0.951003
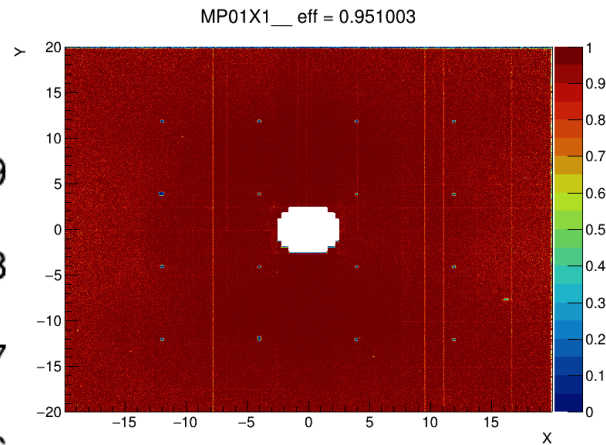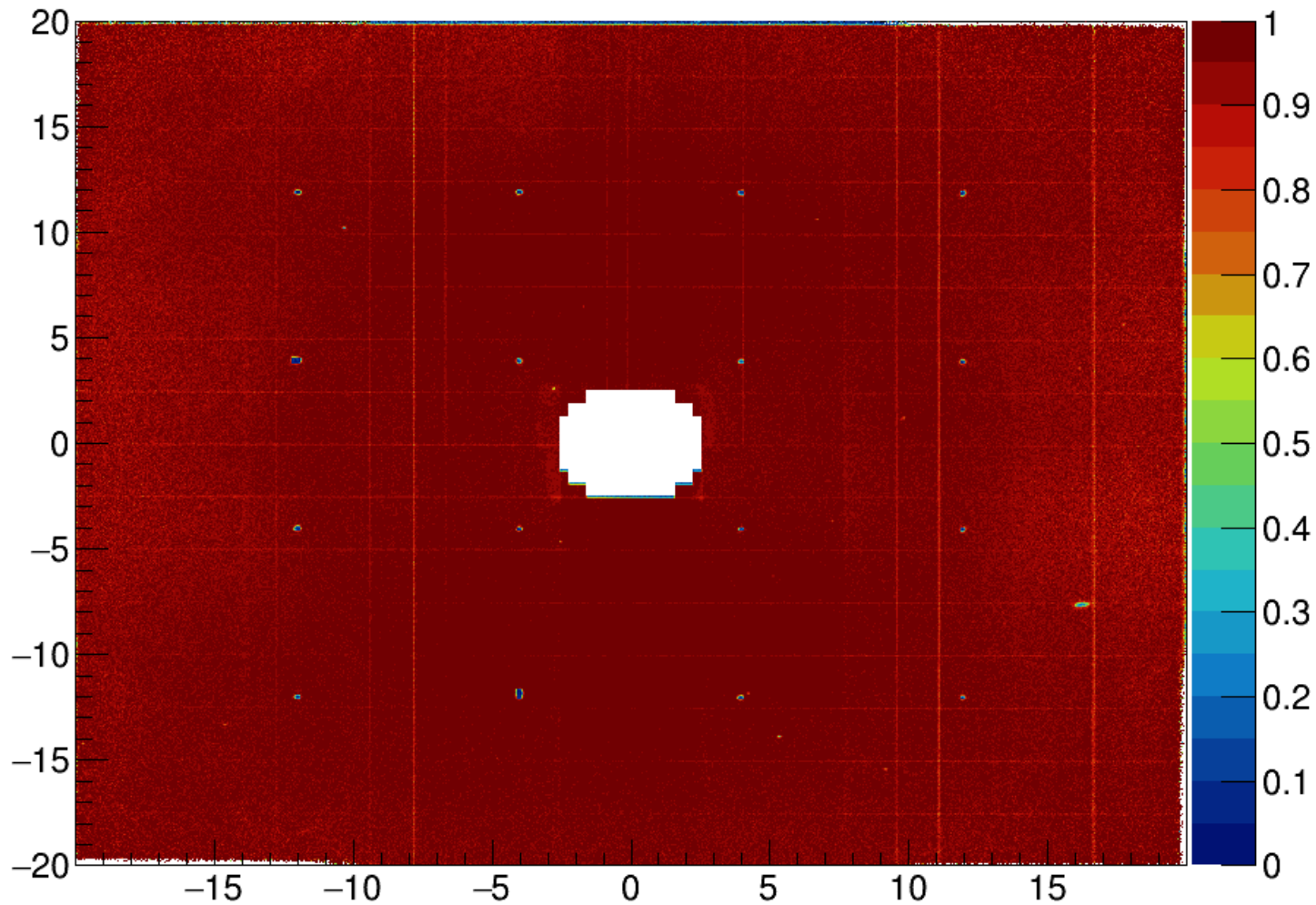
P05t1

MP01Y1__ : Eff. = 95.73 ± 0.01 %

Entries   1.257555e+08

MP01Y1__ eff = 0.954723
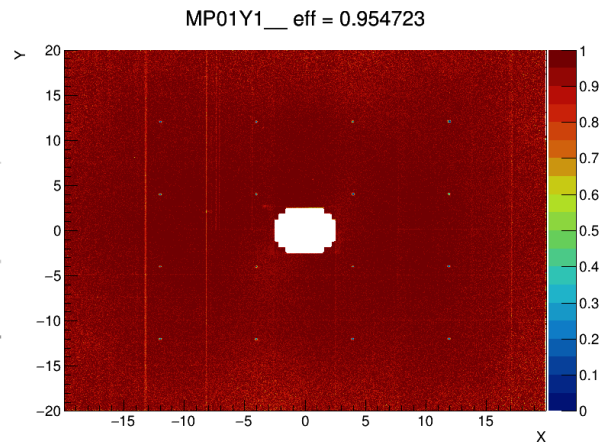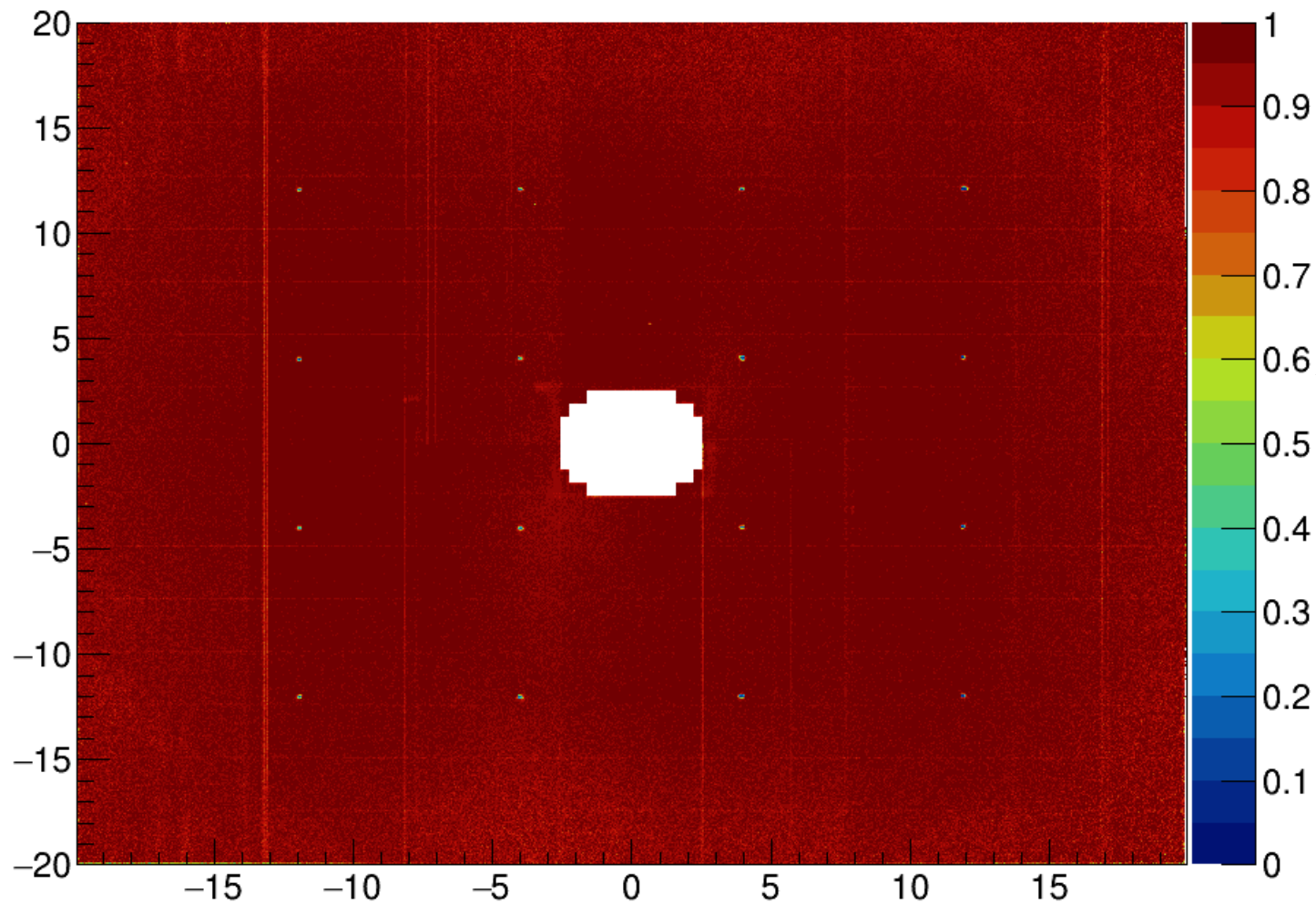
P05t1

MP01U1__ : Eff. = 95.28 ± 0.01 %

Entries 1.151162e+08

MP01U1__ eff = 0.947492
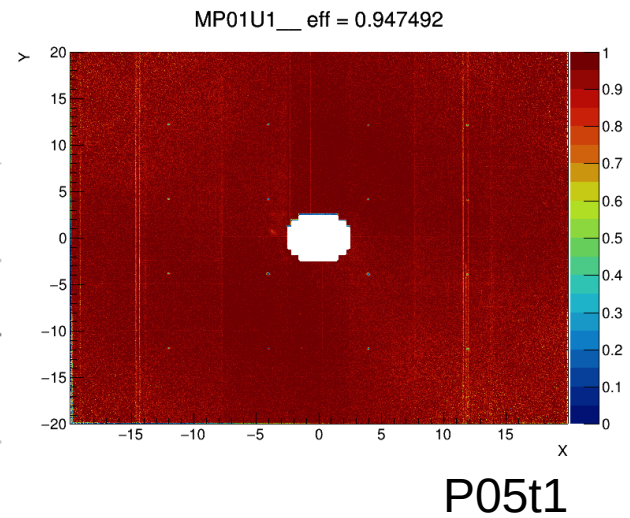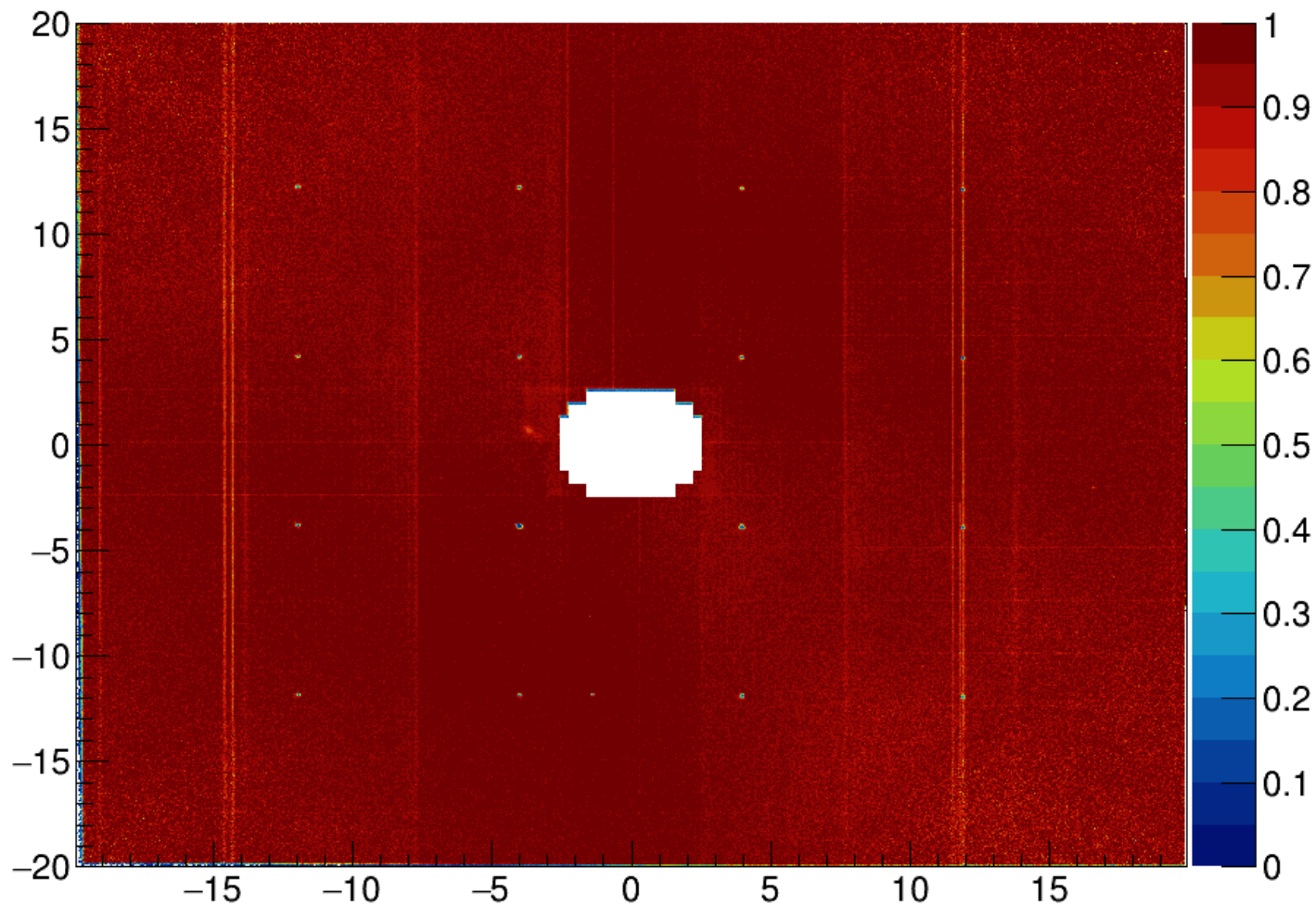
P05t1

MP01V1__ : Eff. = 95.20 ± 0.01 %

Entries 1.149447e+08

MP01V1__ eff = 0.945070
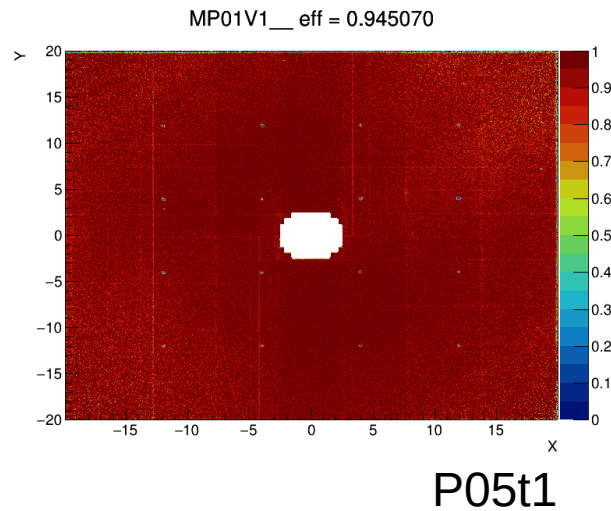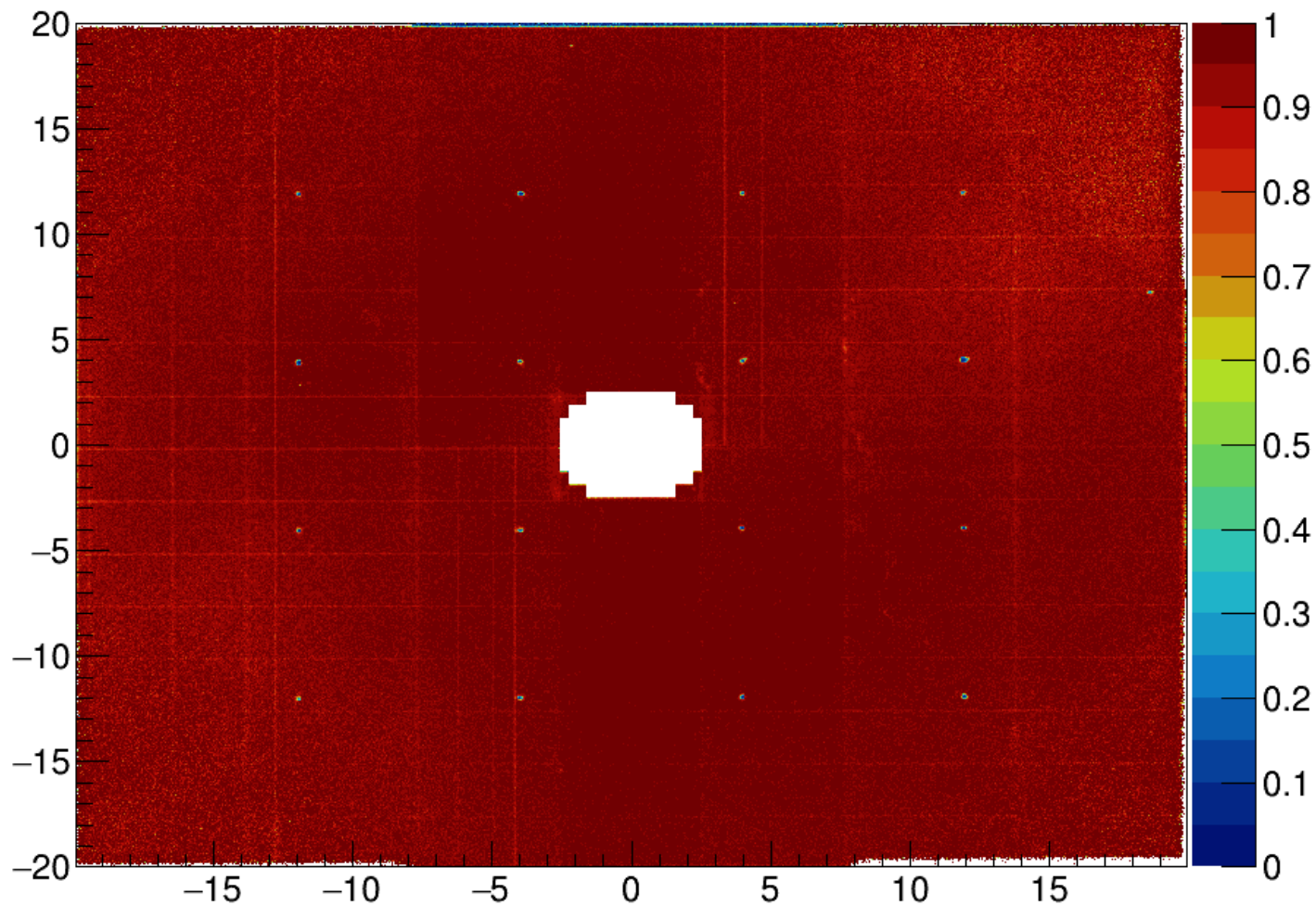
P05t1

MP02X1__ : Eff. = 96.68 ± 0.01 %

Entries 1.153184e+08

MP02X1___ eff = 0.818577
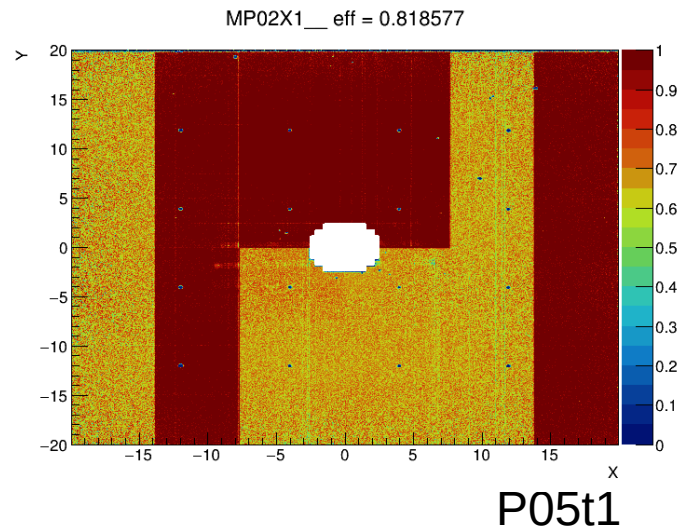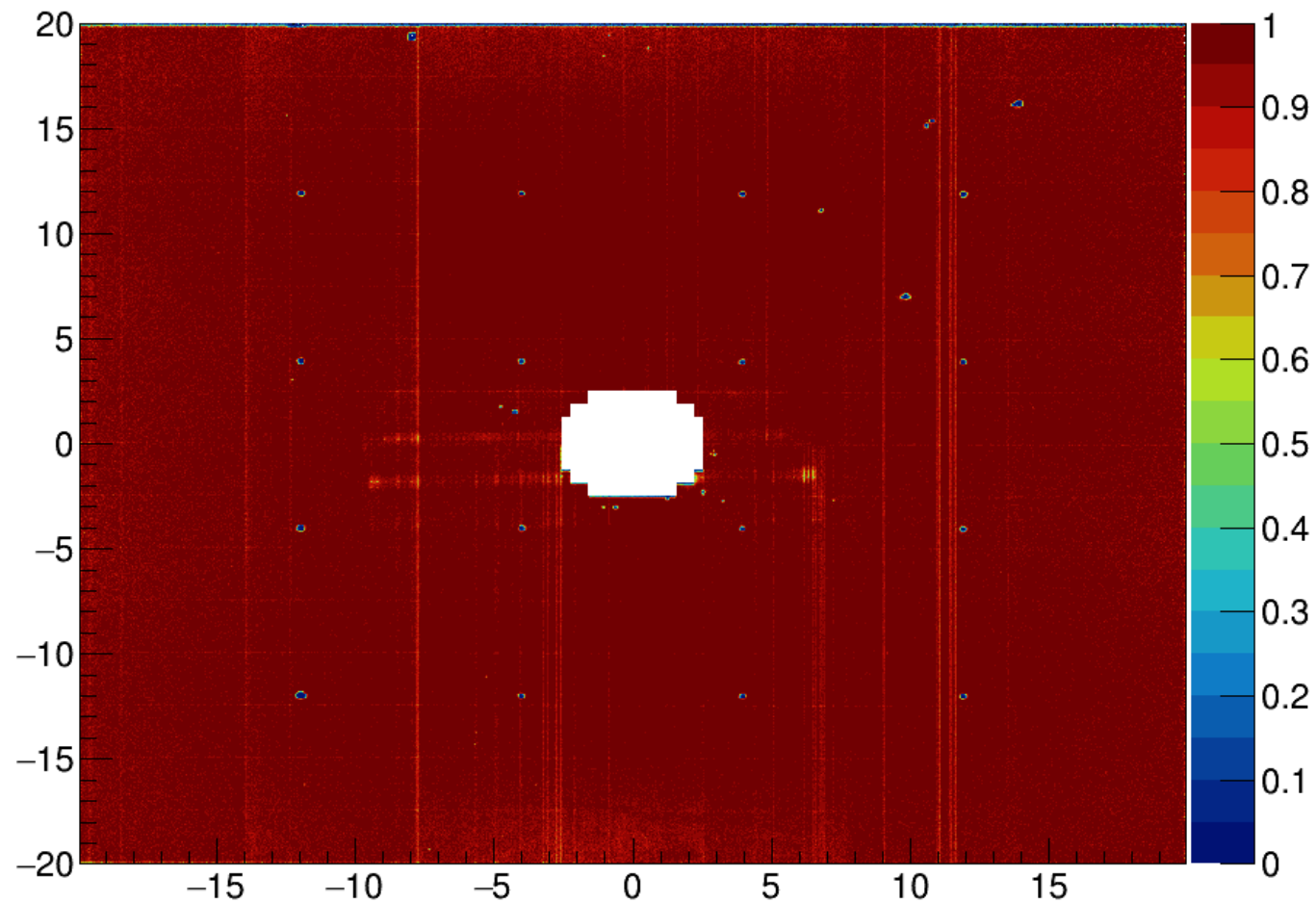
P05t1

MP02Y1__ : Eff. = 97.25 ± 0.01 %

Entries 1.101506e+08
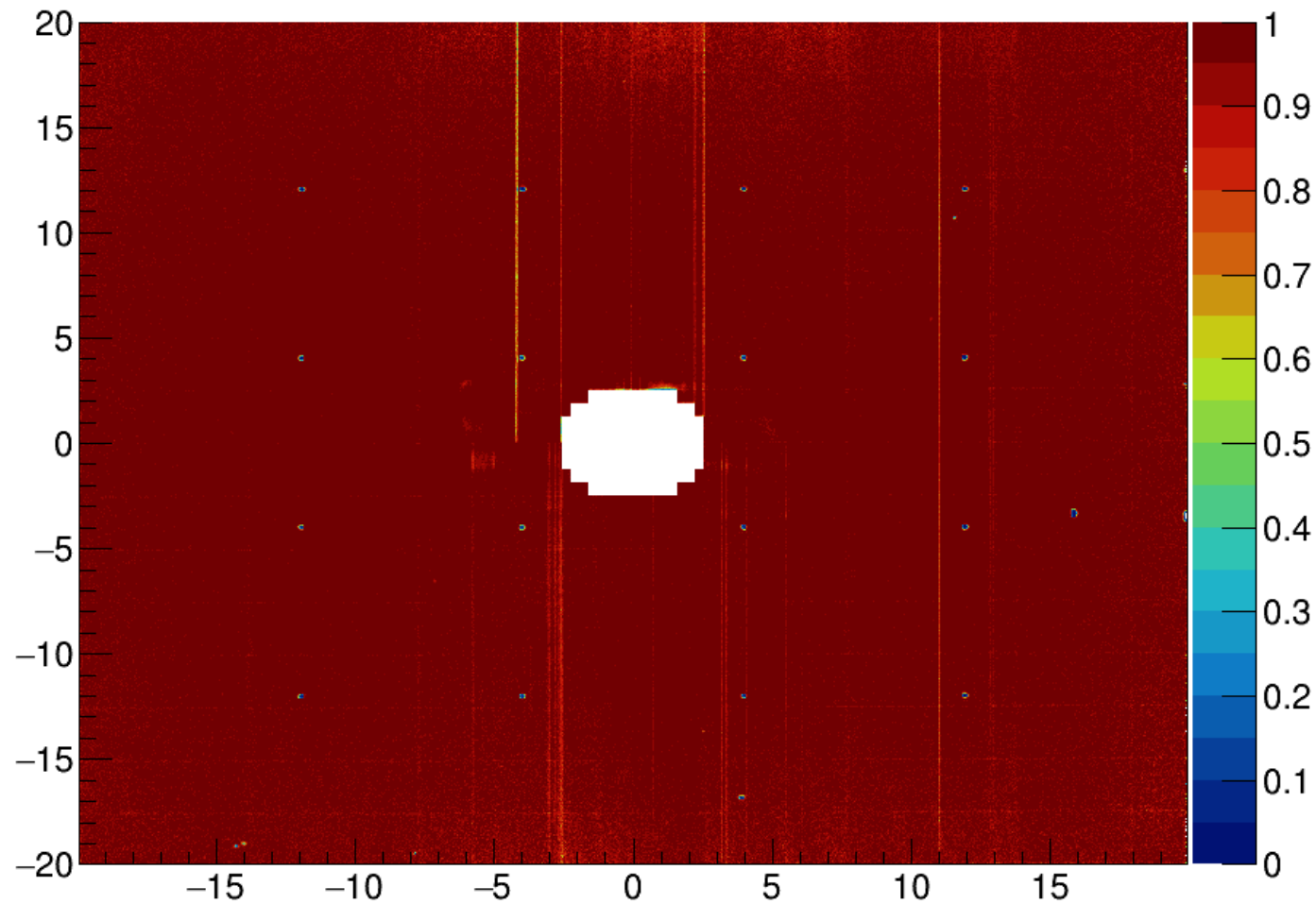
MP02Y1__ eff = 0.821792
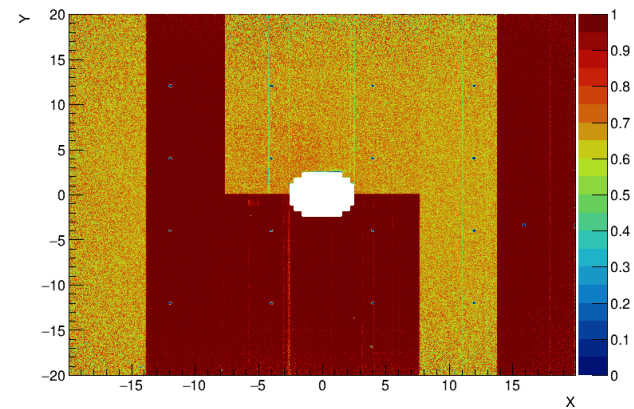
P05t1

MP02U1__ : Eff. = 95.97 ± 0.01 %

Entries 1.219956e+08
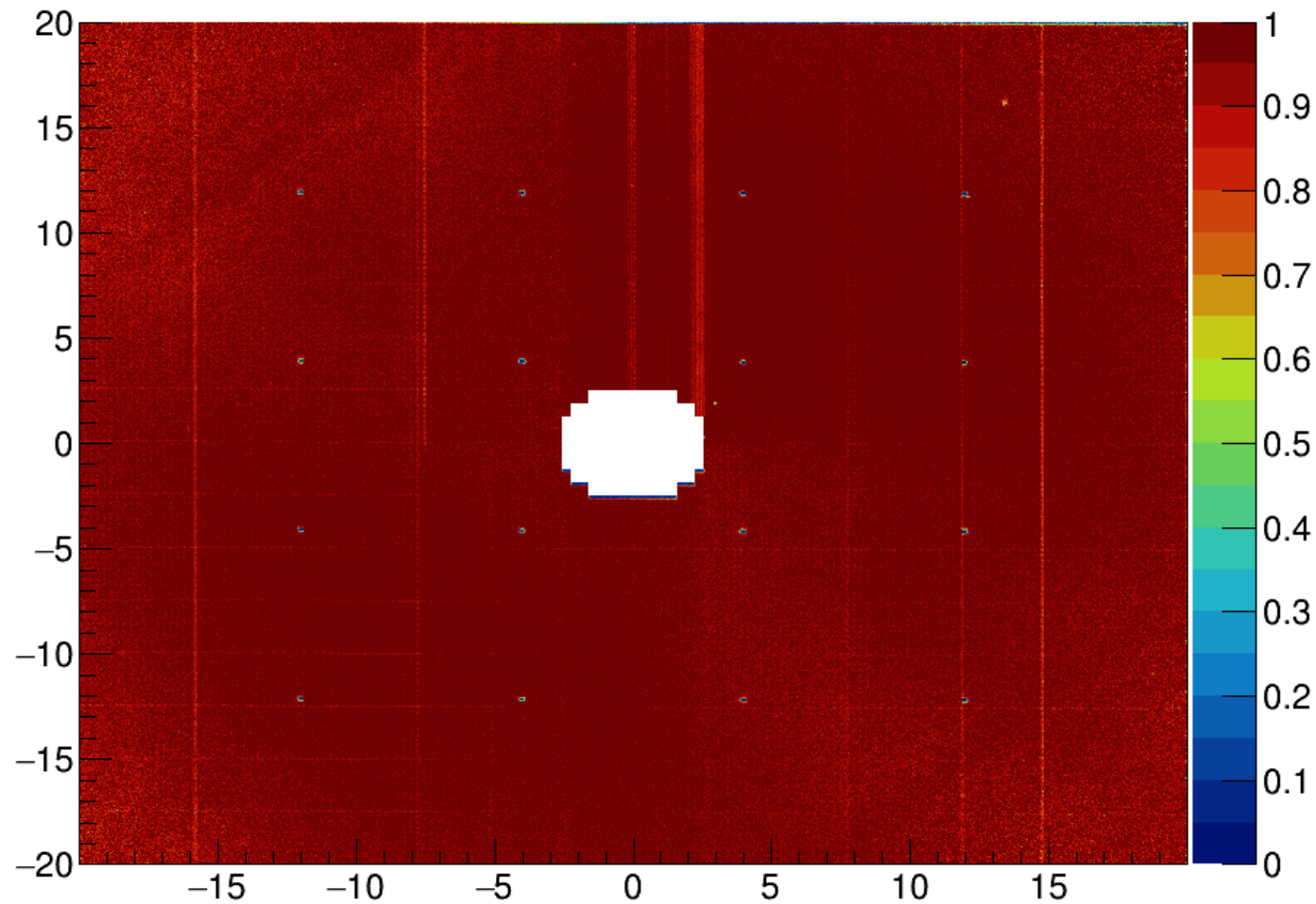
MP02U1__ eff = 0.974158
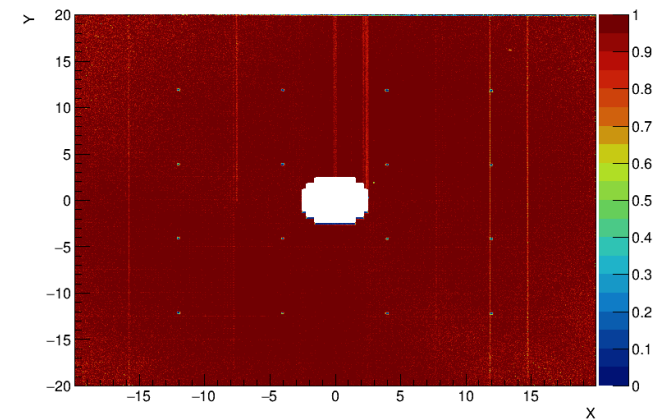
P05t1

MP02V1__ : Eff. = 96.84 ± 0.01 %

Entries 1.181069e+08

MP02V1__ eff = 0.979511
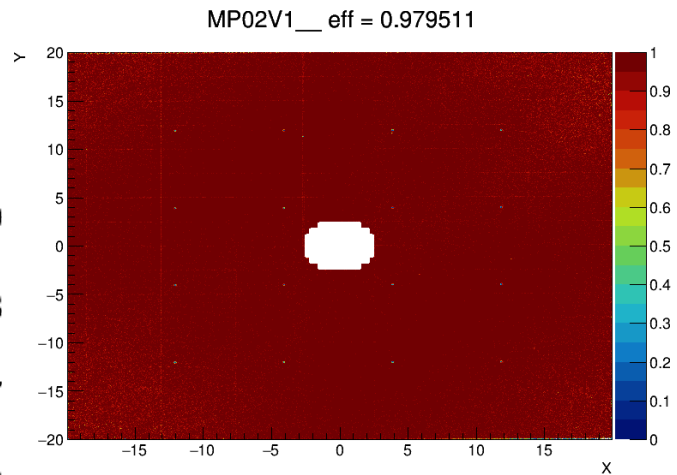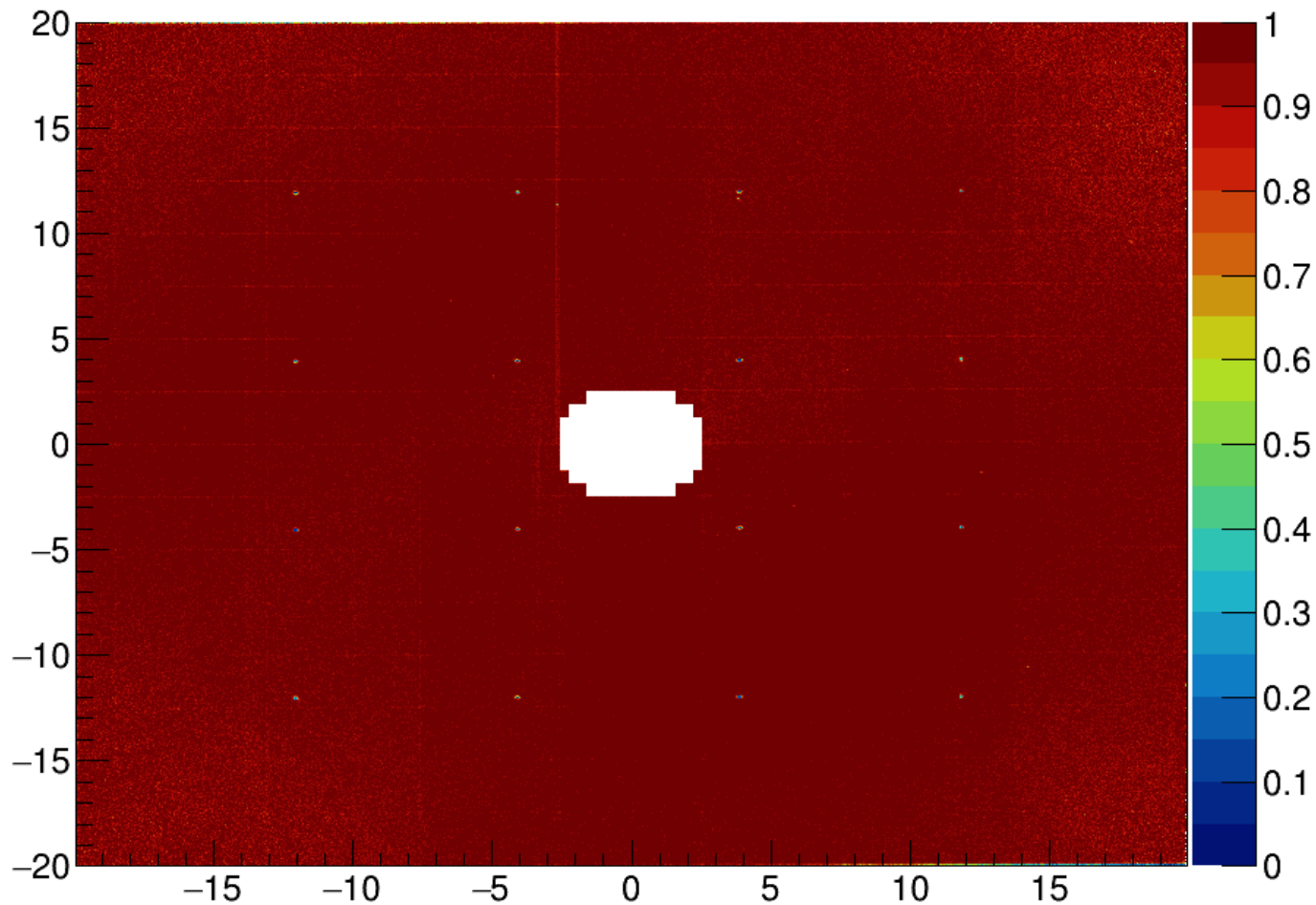
P05t1

MP03X1___ : Eff. = 96.45 ± 0.01 %

Entries 1.132305e+08
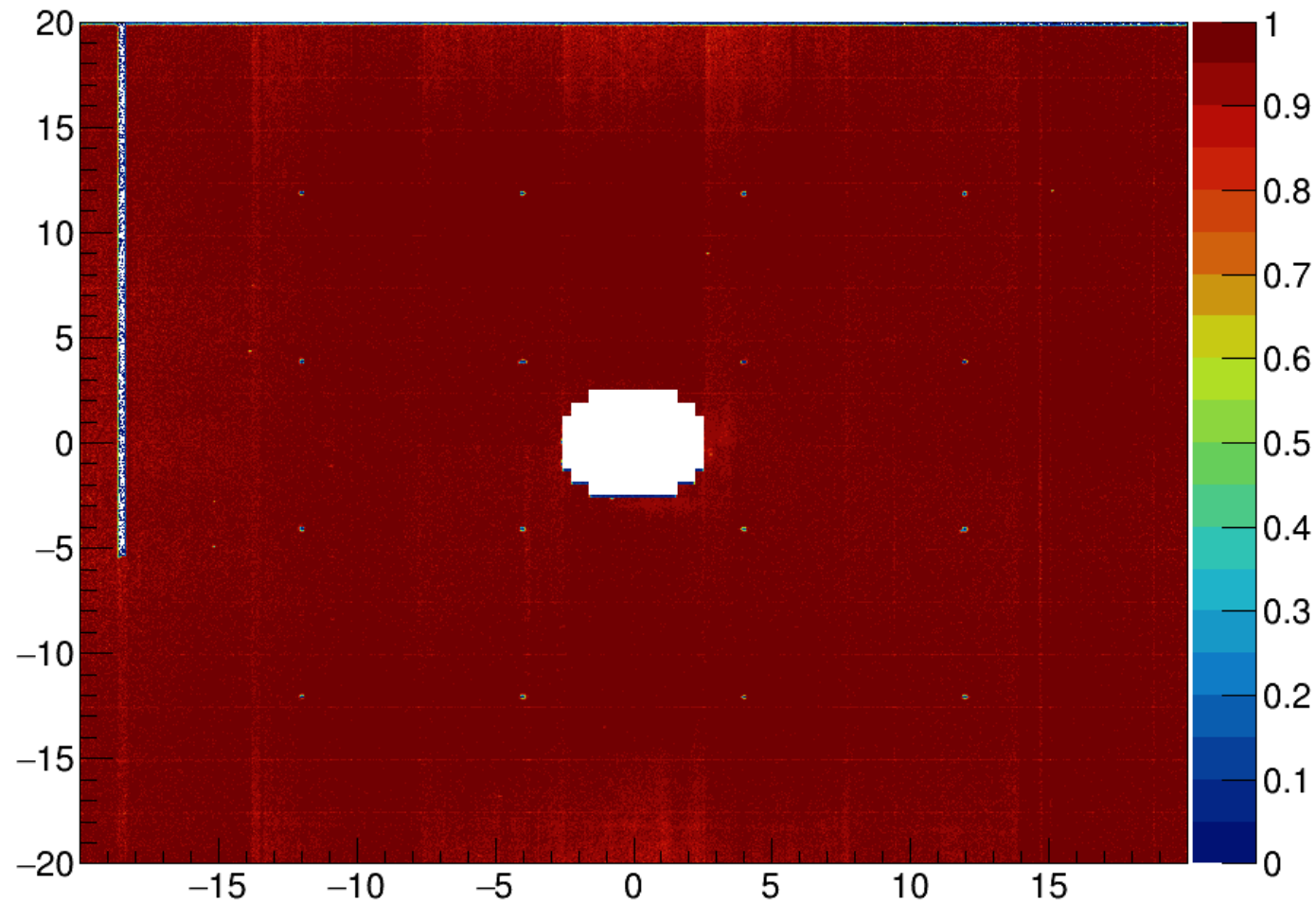
MP03X1___ eff = 0.977583
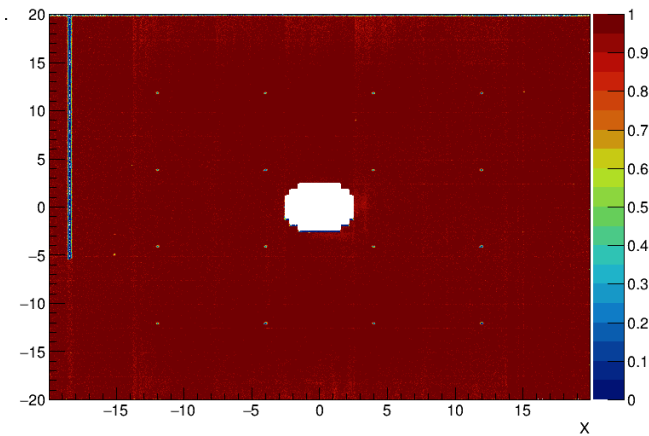
P05t1

MP03Y1__ : Eff. = 98.60 ± 0.01 %

Entries   9.938937e+07

MP03Y1__ eff = 0.990771
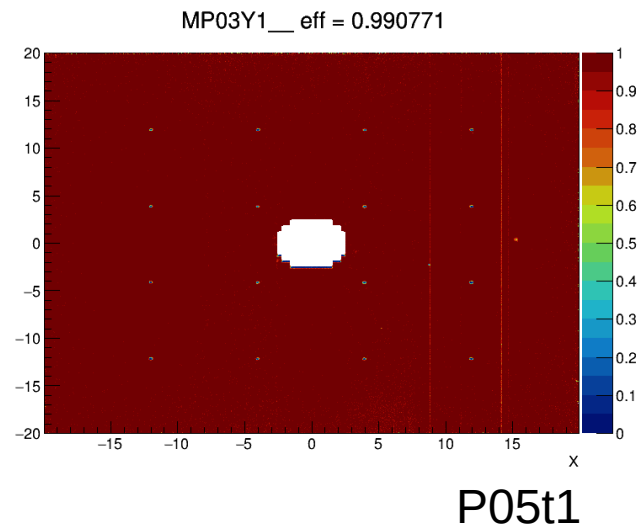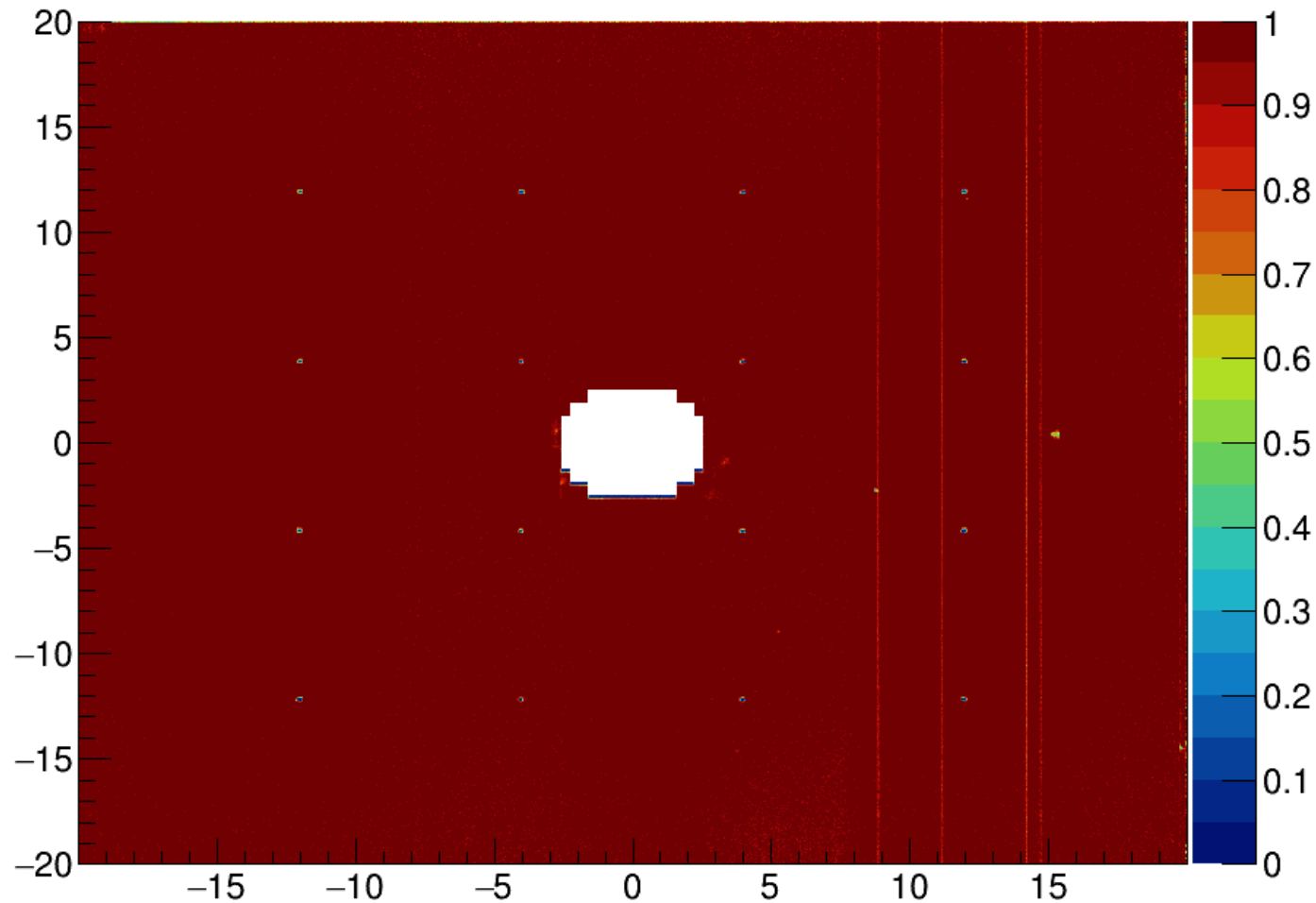
P05t1

MP03U1__ : Eff. = 96.63 ± 0.01 %

Entries   9.805329e+07
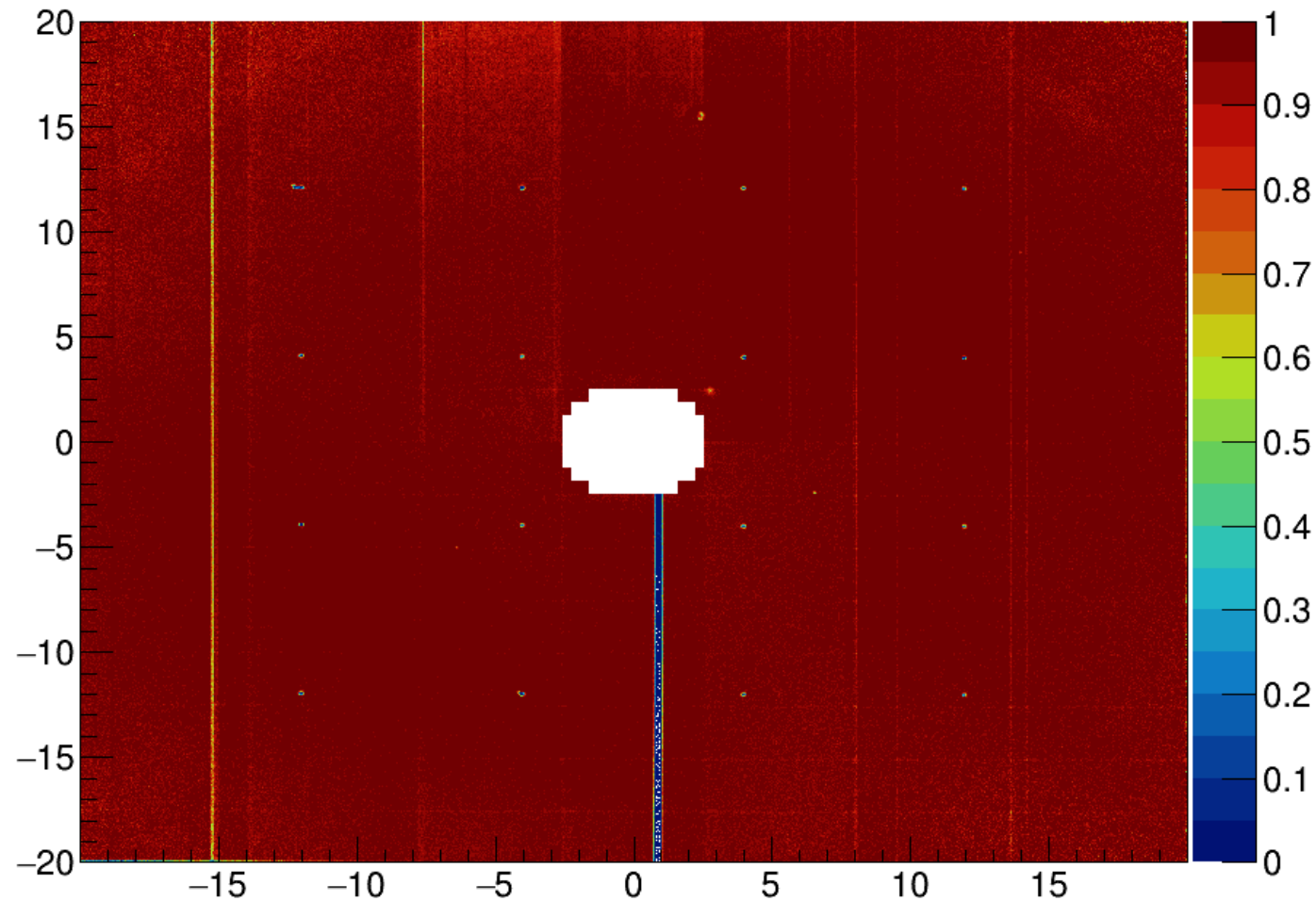
MP03U1__ eff = 0.978569
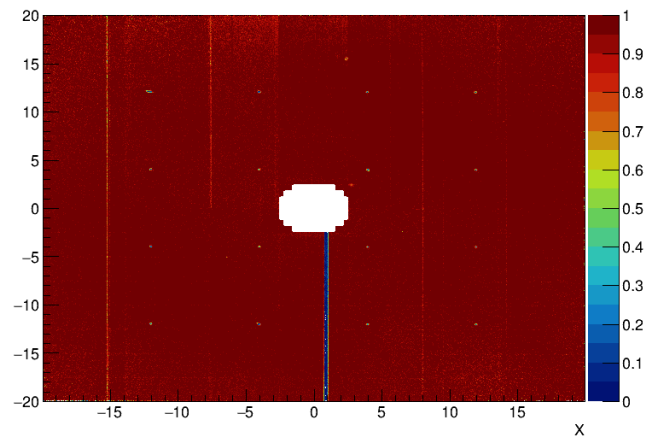
P05t1

MP03V1__ : Eff. = 98.03 ± 0.01 %

Entries   1.024201e+08
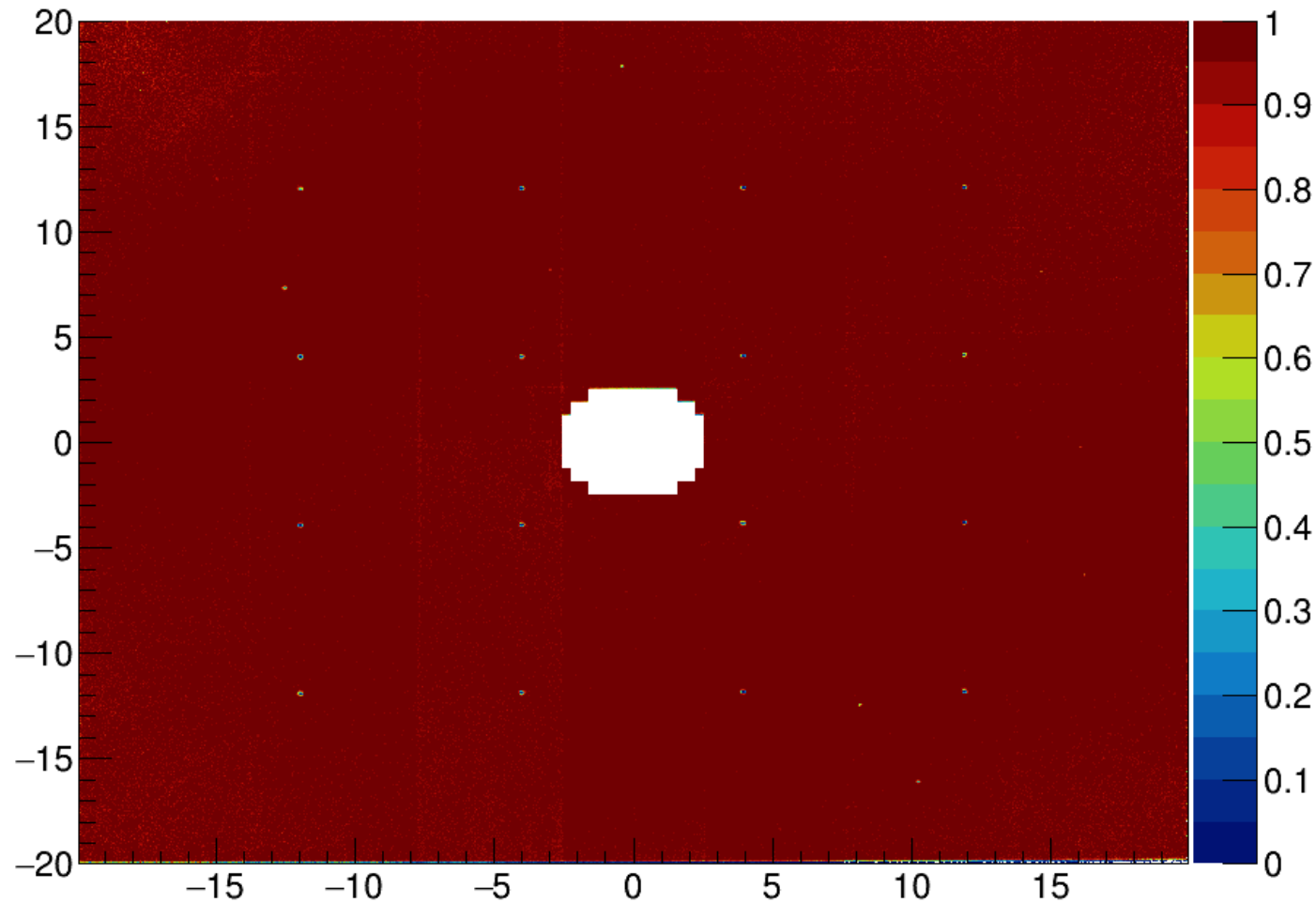
MP03V1__ eff = 0.988397
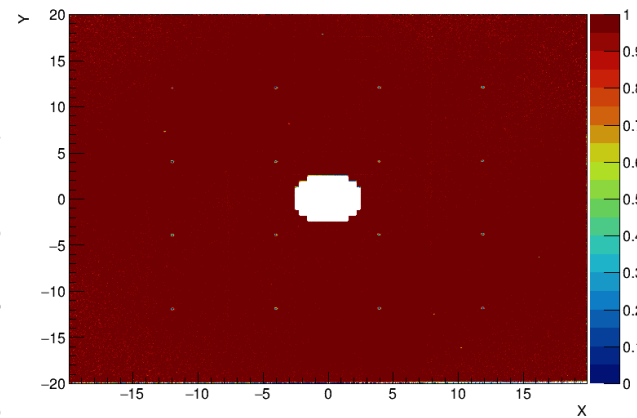
P05t1

Drift detectors performance

From Yann Bedfer's AnalizeDCs

DC00U1 - 0x847 - #287315

DC00U1__: Efficiency-Background (6σ) = 64.25±0.01%
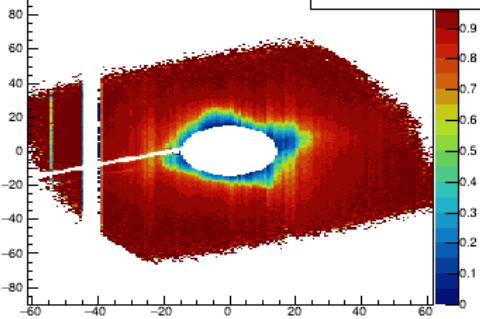
DC00U1__: Resolution = Residu-Tracking(/=60)

$\sigma1 = 517 \pm 1\mu$
$\sigma2 = 775 \pm 1\mu$
$\delta = 46 \pm 0\mu$
$\sigma R = 676 \pm 0\mu$
$\sigma T = 142 \pm 0\mu$
$\sigma = 661 \pm 0\mu$
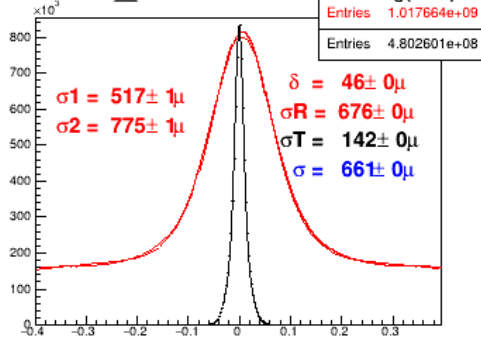
DC00U1__: Efficiency-Background (6σ) = 64.25±0.01%
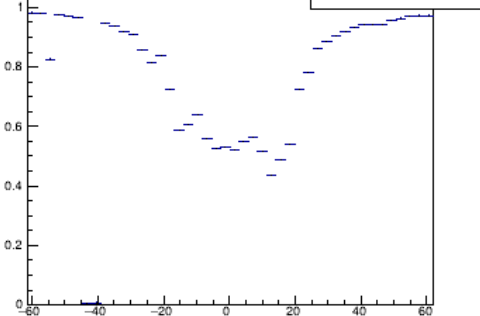
DC00U1__: Efficiency × Acceptance (6σ) = 31.16±0.00%

DC00U2 - 0x847 - #287315

DC00U2__: Efficiency-Background (6σ) = 72.66±0.01%
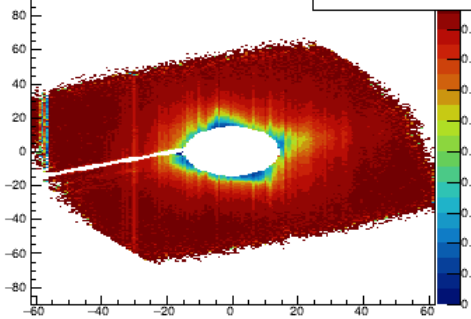
DC00U2__: Resolution = Residu-Tracking(/=60)

$\sigma1 = 522 \pm 1\mu$
$\sigma2 = 783 \pm 1\mu$
$\delta = 36 \pm 1\mu$
$\sigma R = 675 \pm 0\mu$
$\sigma T = 137 \pm 0\mu$
$\sigma = 661 \pm 0\mu$
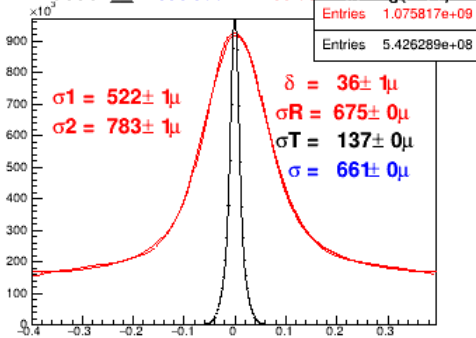
DC00U2__: Efficiency-Background (6σ) = 72.66±0.01%
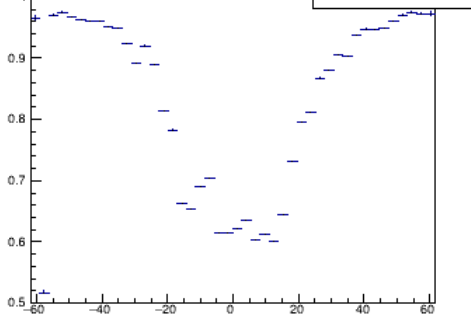
DC00U2__: Efficiency × Acceptance (6σ) = 34.97±0.00%

DC00X1 - 0x847 - #287315

DC00X1__: Efficiency-Background (6σ) = 88.34±0.00%
Entries 7.538258e+07

DC00X1__: Resolution = Residu-Tracking(/=60)
Entries 1.19241e+09
Entries 6.693532e+08

$\sigma1 = 473\pm 0\mu$
$\sigma2 = 709\pm 1\mu$
$\delta = 22\pm 0\mu$
$\sigma R = 619\pm 0\mu$
$\sigma T = 128\pm 0\mu$
$\sigma = 606\pm 0\mu$

DC00X1__: Efficiency-Background (6σ) = 88.34±0.00%
Entries 7.538258e+07

DC00X1__: Efficiency × Acceptance (6σ) = 42.11±0.00%
Entries 1.84816e+08
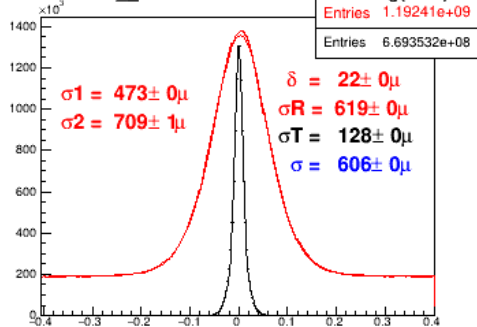
DC00X2 - 0x847 - #287315

DC00X2__: Efficiency-Background (6σ) = 84.69±0.00%
Entries 7.570106e+07

DC00X2__: Resolution = Residu-Tracking(/=60)
Entries 1.110855e+09
Entries 6.453316e+08

$\sigma1 = 454\pm 0\mu$
$\sigma2 = 681\pm 1\mu$
$\delta = 37\pm 0\mu$
$\sigma R = 584\pm 0\mu$
$\sigma T = 124\pm 0\mu$
$\sigma = 571\pm 0\mu$

DC00X2__: Efficiency-Background (6σ) = 84.69±0.00%
Entries 7.570106e+07
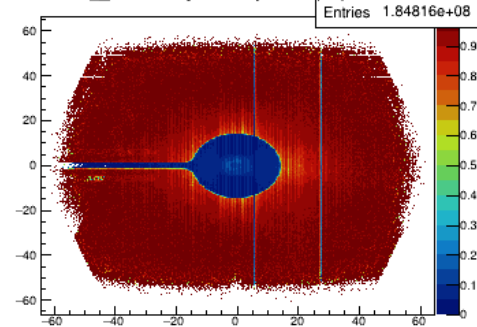
DC00X2__: Efficiency × Acceptance (6σ) = 40.95±0.00%
Entries 1.84816e+08

DC00Y1 - 0x847 - #287315

DC00Y2 - 0x847 - #287315

DC00Y1__: Efficiency-Background (6σ) = 85.68±0.00%

Entries   6.810461e+07

DC00Y1__: Resolution = Residu-Tracking(/=60)

Entries   1.159762e+09
Entries   5.879717e+08

σ1 = 448± 0μ
σ2 = 672± 0μ

δ = -10± 1μ
σR = 585± 0μ
σT = 248± 0μ
σ = 529± 0μ

DC00Y2__: Efficiency-Background (6σ) = 89.18±0.00%

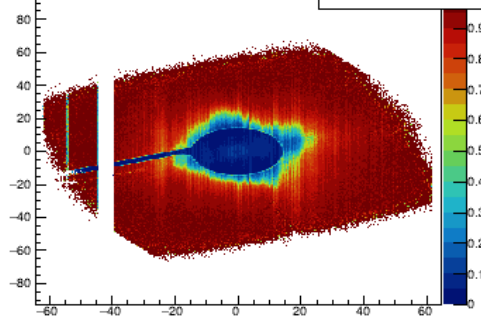Entries   6.840451e+07

DC00Y2__: Resolution = Residu-Tracking(/=60)

Entries   1.187074e+09
Entries   6.134557e+08

σ1 = 438± 0μ
σ2 = 657± 0μ

δ = -12± 0μ
σR = 569± 0μ
σT = 244± 0μ
σ = 514± 0μ

DC00Y1__: Efficiency-Background (6σ) = 85.68±0.00%

Entries   6.810461e+07

DC00Y1__: Efficiency × Acceptance (6σ) = 39.04±0.00%

Entries   1.734815e+08

DC00Y2__: Efficiency-Background (6σ) = 89.18±0.00%

Entries   6.840451e+07

DC00Y2__: Efficiency × Acceptance (6σ) = 40.84±0.00%

Entries   1.734815e+08

DC01U1 - 0x847 - #287315
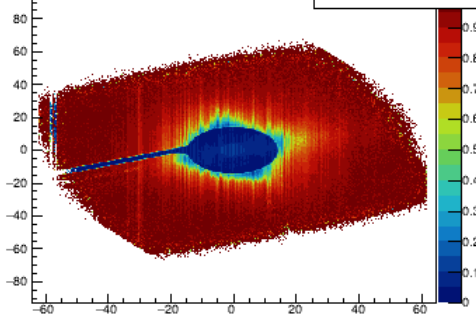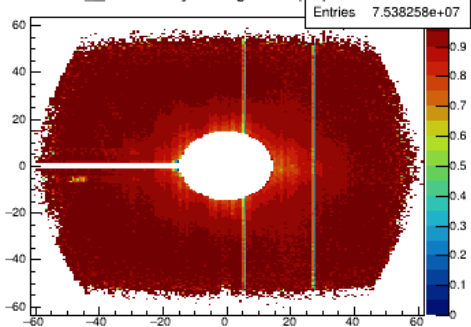
DC01U1__: Efficiency-Background (6σ) = 88.80±0.00%

DC01U1__: Resolution = Residu-Tracking(/=60)

Entries 1.12981e+08

Entries 1.135712e+09

Entries 1.006331e+09

σ1 = 352± 0μ
σ2 = 527± 0μ

δ = -34± 0μ
σR = 454± 0μ
σT = 122± 0μ
σ = 438± 0μ

DC01U1__: Efficiency-Background (6σ) = 88.80±0.00%

Entries 1.12981e+08
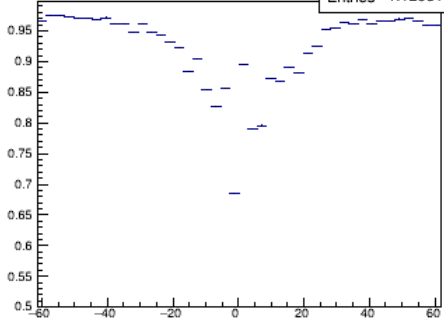
DC01U1__: Efficiency × Acceptance (6σ) = 58.68±0.00%

Entries 1.824872e+08

DC01U2 - 0x847 - #287315
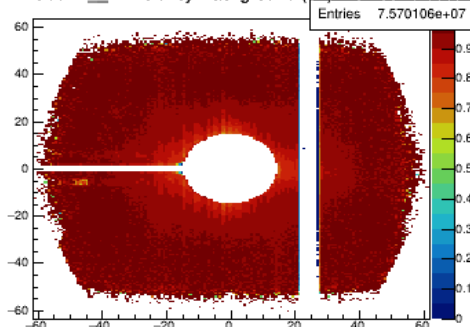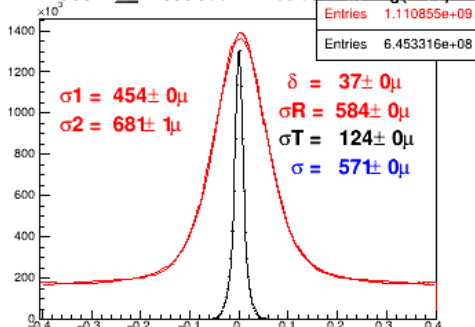
DC01U2__: Efficiency-Background (6σ) = 83.00±0.00%

DC01U2__: Resolution = Residu-Tracking(/=60)

Entries 1.132414e+08

Entries 1.077098e+09

Entries 9.442305e+08

σ1 = 344± 0μ
σ2 = 517± 0μ

δ = -36± 0μ
σR = 445± 0μ
σT = 123± 0μ
σ = 428± 0μ
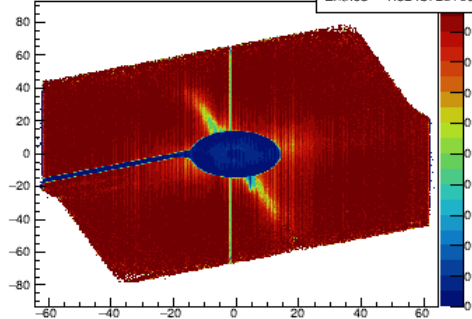
DC01U2__: Efficiency-Background (6σ) = 83.00±0.00%

Entries 1.132414e+08
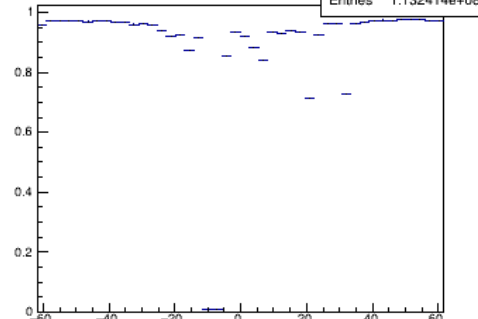
DC01U2__: Efficiency × Acceptance (6σ) = 55.07±0.00%

Entries 1.824792e+08
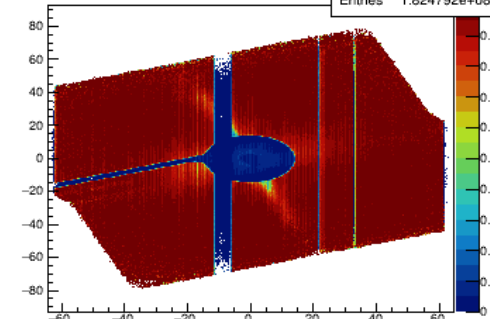
DC01V1 - 0x847 - #287315

DC01V1__: Efficiency-Background (6σ) = 92.10±0.00%

DC01V1__: Resolution = Residu-Tracking(/=60)

σ1 = 348± 0μ
σ2 = 522± 0μ
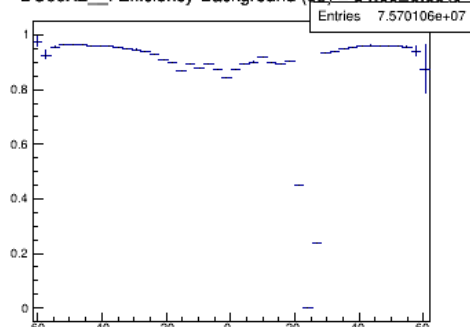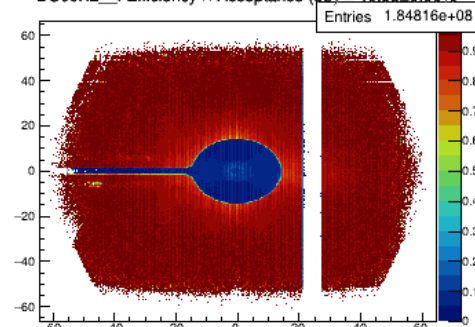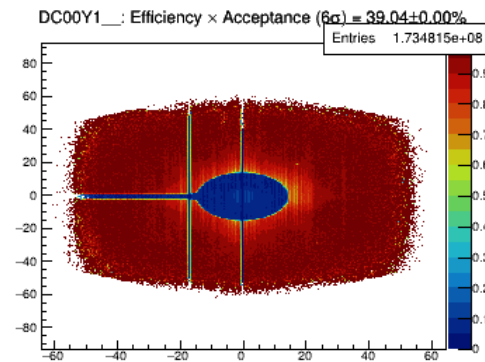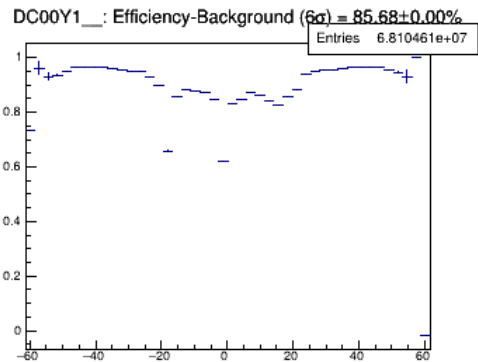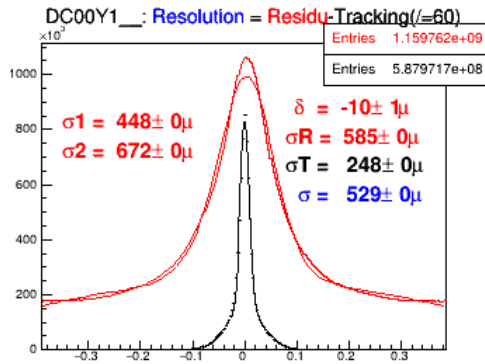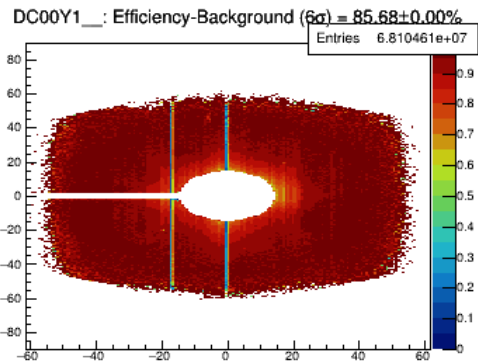δ = -70± 0μ
σR = 451± 0μ
σT = 124± 0μ
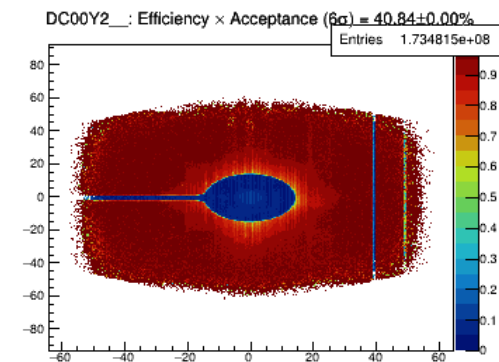σ = 433± 0μ

DC01V1__: Efficiency-Background (6σ) = 92.10±0.00%

DC01V1__: Efficiency × Acceptance (6σ) = 61.45±0.00%
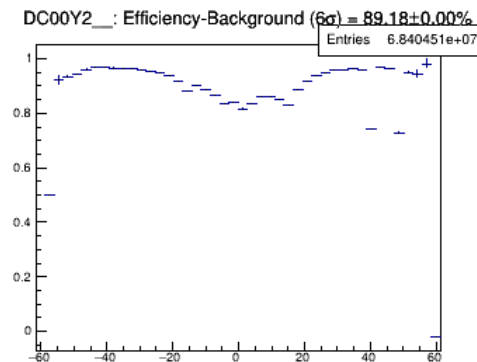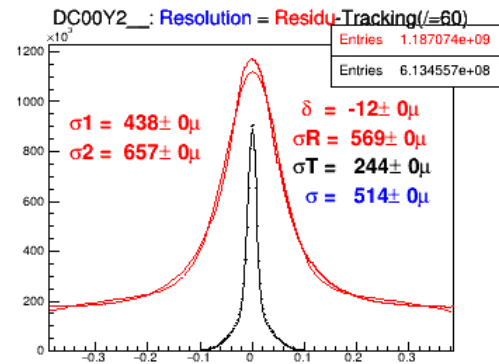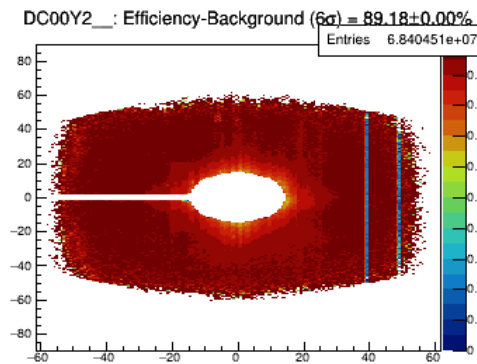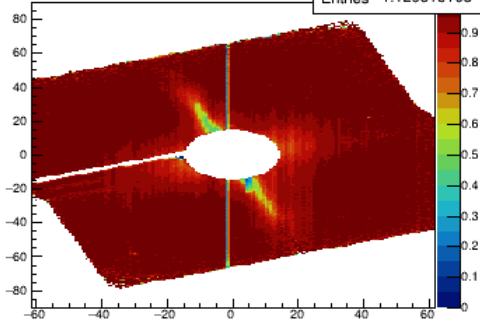
DC01V2 - 0x847 - #287315

DC01V2__: Efficiency-Background (6σ) = 89.63±0.00%

DC01V2__: Resolution = Residu-Tracking(/=60)

σ1 = 367± 0μ
σ2 = 550± 0μ
δ = -44± 0μ
σR = 476± 0μ
σT = 125± 0μ
σ = 460± 0μ
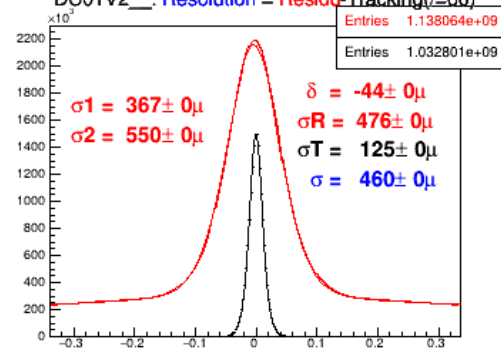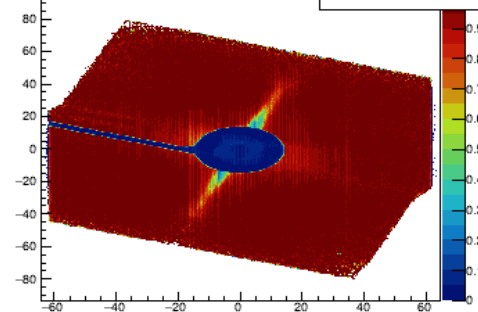
DC01V2__: Efficiency-Background (6σ) = 89.63±0.00%

DC01V2__: Efficiency × Acceptance (6σ) = 59.50±0.00%

DC01X1 - 0x847 - #287315

DC01X1__: Efficiency-Background (6σ) = 94.71±0.00%

Entries 1.082011e+08

DC01X1__: Resolution = Residu-Tracking(/=60)

Entries 1.129e+09
Entries 1.026278e+09

$\sigma1 = 332\pm 0\mu$
$\sigma2 = 498\pm 0\mu$
$\delta = -46\pm 0\mu$
$\sigma R = 426\pm 0\mu$
$\sigma T = 109\pm 0\mu$
$\sigma = 411\pm 0\mu$

DC01X1__: Efficiency-Background (6σ) = 94.71±0.00%

Entries 1.082011e+08

DC01X1__: Efficiency × Acceptance (6σ) = 62.16±0.00%

Entries 1.773324e+08

DC01X2 - 0x847 - #287315

DC01X2__: Efficiency-Background (6σ) = 95.71±0.00%

Entries 1.084538e+08

DC01X2__: Resolution = Residu-Tracking(/=60)

Entries 1.134398e+09
Entries 1.039186e+09

$\sigma1 = 370\pm414\mu$
$\sigma2 = 553\pm673\mu$
$\delta = -12\pm724\mu$
$\sigma R = 404\pm541\mu$
$\sigma T = 109\pm 0\mu$
$\sigma = 388\pm562\mu$

DC01X2__: Efficiency-Background (6σ) = 95.71±0.00%

Entries 1.084538e+08

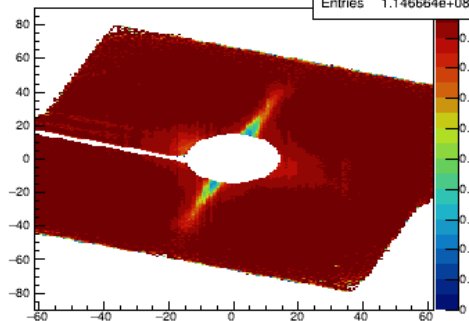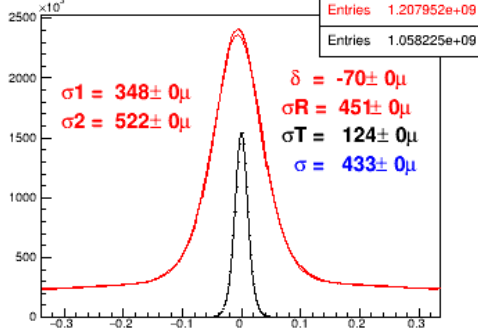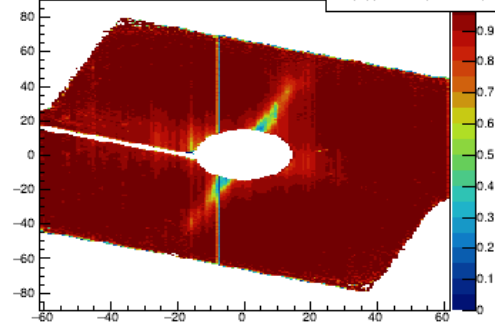**DC01X2__: Efficiency × Acceptance (6σ) = 63.03±0.00%**

Entries 1.773275e+08

DC01Y1 - 0x847 - #287315

DC01Y1__: Efficiency-Background (6σ) = 92.33±0.00%

Entries 1.056659e+08

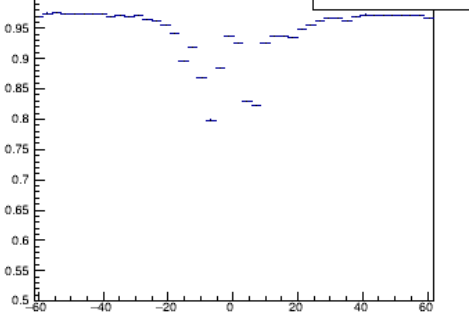DC01Y1__: Resolution = Residu-Tracking(/=60)

Entries 1.217671e+09
Entries 9.781437e+08

$\sigma1 = 394\pm 0\mu$
$\sigma2 = 591\pm 0\mu$
$\delta = 32\pm 0\mu$
$\sigma R = 510\pm 0\mu$
$\sigma T = 175\pm 0\mu$
$\sigma = 479\pm 0\mu$

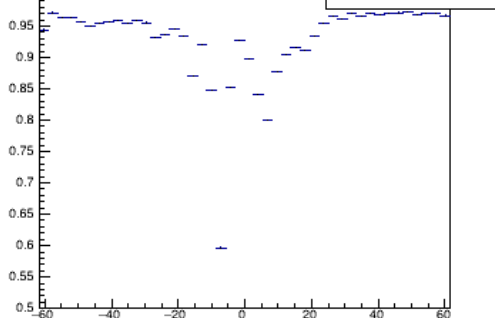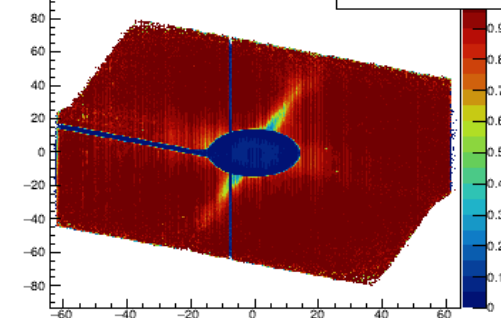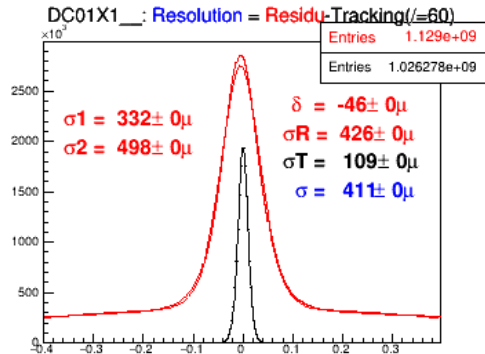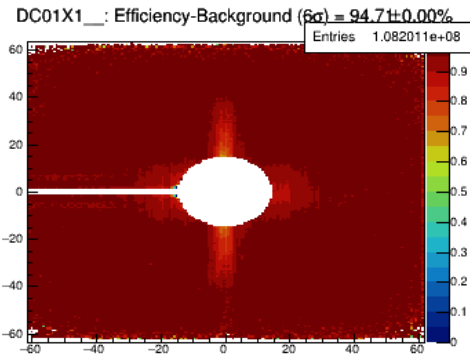DC01Y1__: Efficiency-Background (6σ) = 92.33±0.00%

Entries 1.056659e+08

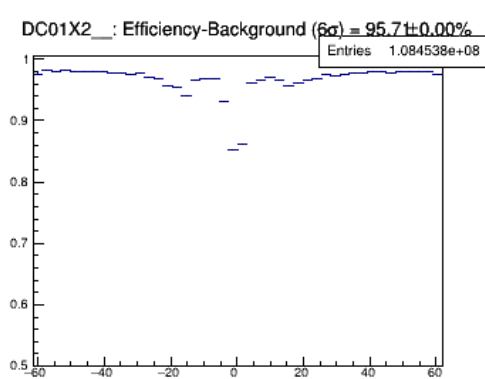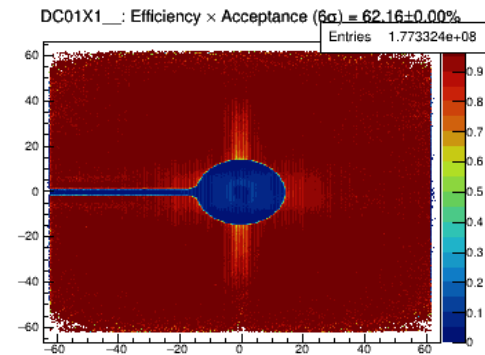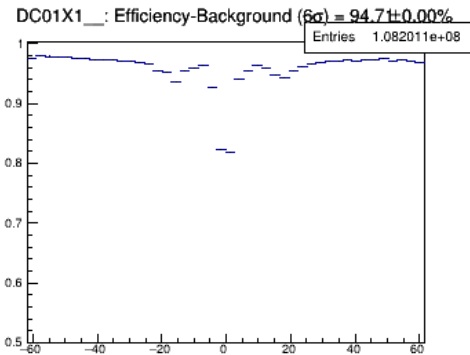DC01Y1__: Efficiency × Acceptance (6σ) = 59.08±0.00%
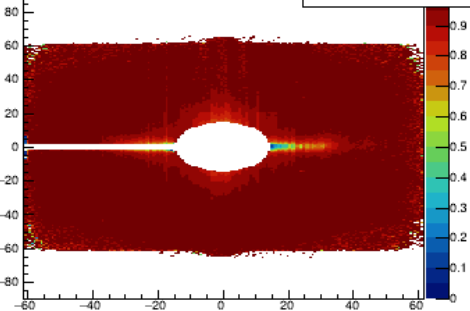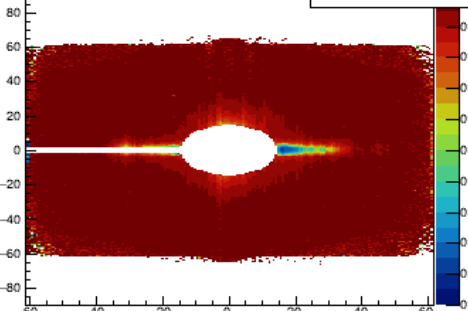
Entries 1.77817e+08
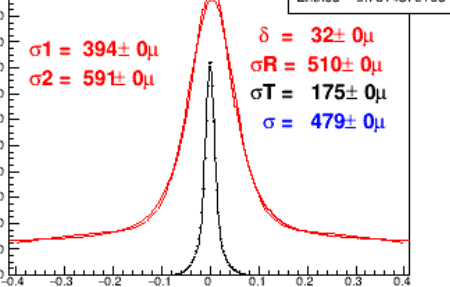
DC01Y2 - 0x847 - #287315

DC01Y2__: Efficiency-Background (6σ) = 91.29±0.00%

Entries 1.059343e+08

DC01Y2__: Resolution = Residu-Tracking(/=60)

Entries 1.234229e+09
Entries 9.699569e+08

$\sigma1 = 413\pm 0\mu$
$\sigma2 = 620\pm 0\mu$
$\delta = 34\pm 0\mu$
$\sigma R = 535\pm 0\mu$
$\sigma T = 176\pm 0\mu$
$\sigma = 505\pm 0\mu$

DC01Y2__: Efficiency-Background (6σ) = 91.29±0.00%

Entries 1.059343e+08
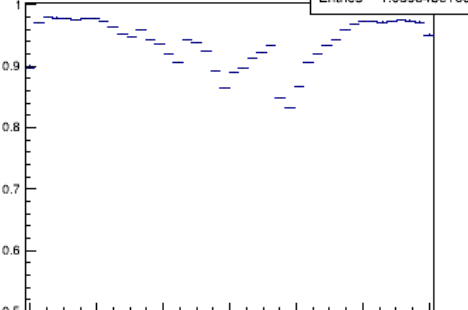
DC01Y2__: Efficiency × Acceptance (6σ) = 58.82±0.00%

Entries 1.77817e+08

DC04U1 - 0x847 - #287315

DC04U1__: Efficiency-Background (6σ) = 94.61±0.00%
Entries 1.643702e+08

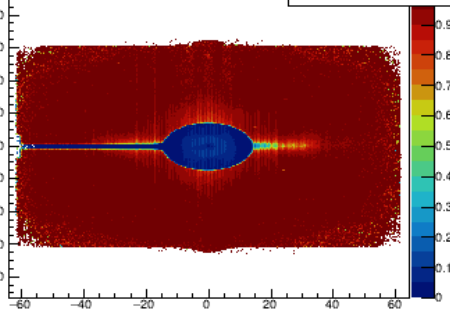### DC04U1__: Resolution = Residu-Tracking(/=60)
Entries 1.412188e+09
Entries 1.556261e+09

$\sigma 1 = 459 \pm 0\mu$
$\sigma 2 = 688 \pm 0\mu$
$\delta = -40 \pm 0\mu$
$\sigma R = 563 \pm 0\mu$
$\sigma T = 110 \pm 0\mu$
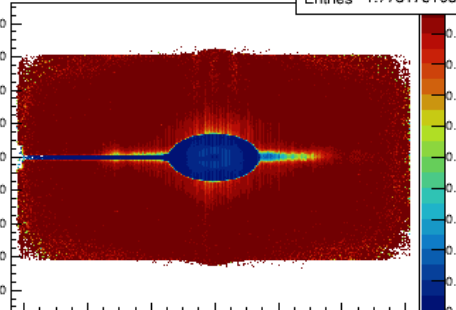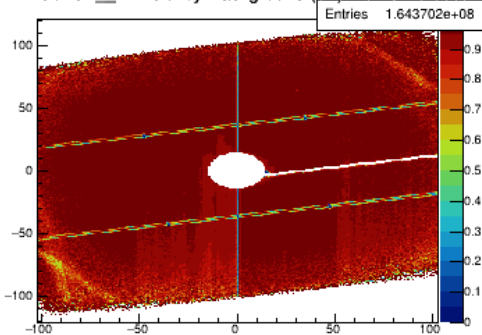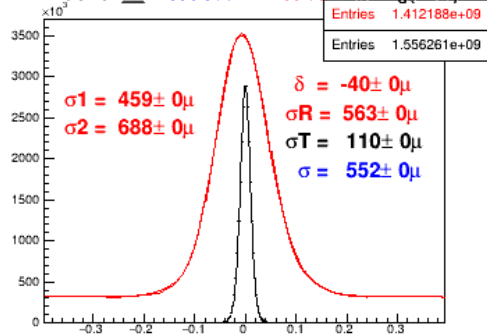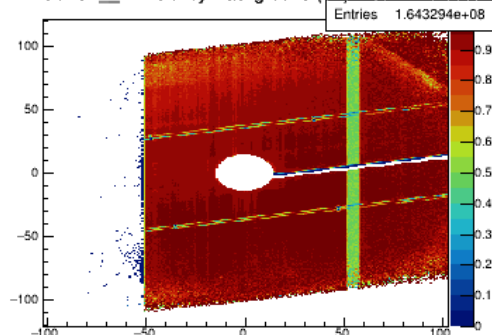$\sigma = 552 \pm 0\mu$

DC04U1__: Efficiency-Background (6σ) = 94.61±0.00%
Entries 1.643702e+08

DC04U1__: Efficiency × Acceptance (6σ) = 81.44±0.00%
Entries 1.931321e+08

DC04U2 - 0x847 - #287315

DC04U2__: Efficiency-Background (6σ) = 89.17±0.00%
Entries 1.643294e+08

DC04U2__: Resolution = Residu-Tracking(/=60)
Entries 1.198222e+09
Entries 1.467233e+09
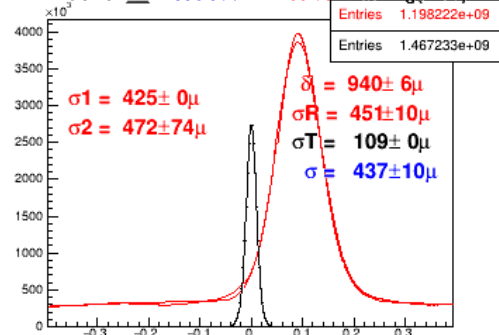
$\sigma 1 = 425 \pm 0\mu$
$\sigma 2 = 472 \pm 74\mu$
$\delta = 940 \pm 6\mu$
$\sigma R = 451 \pm 10\mu$
$\sigma T = 109 \pm 0\mu$
$\sigma = 437 \pm 10\mu$

DC04U2__: Efficiency-Background (6σ) = 89.17±0.00%
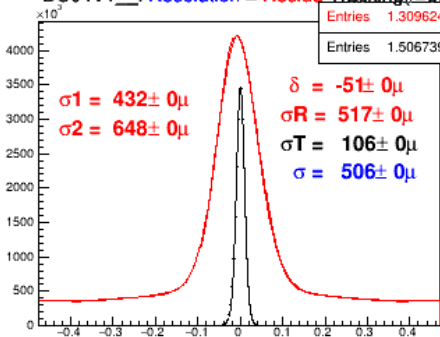Entries 1.643294e+08
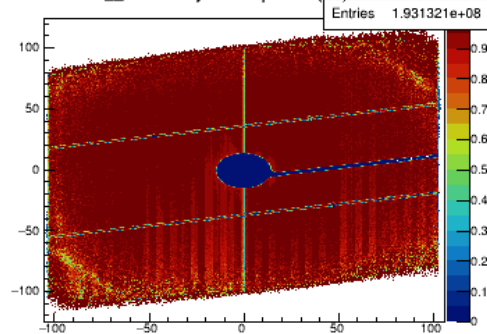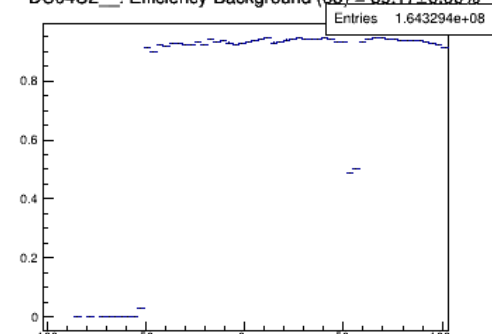
DC04U2__: Efficiency × Acceptance (6σ) = 76.82±0.00%
Entries 1.931372e+08
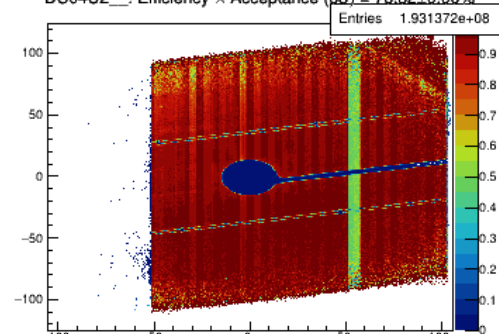
DC04V1 - 0x847 - #287315

DC04V1__: Efficiency-Background (6σ) = 92.54±0.00%

Entries 1.626283e+08
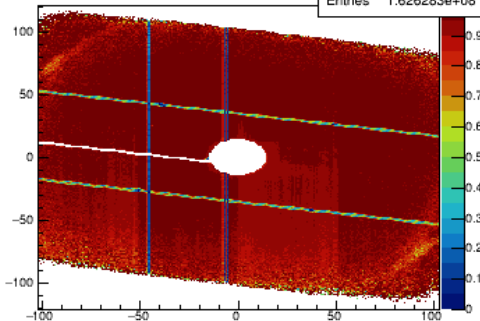
DC04V1__: Resolution = Residu-Tracking(/=60)
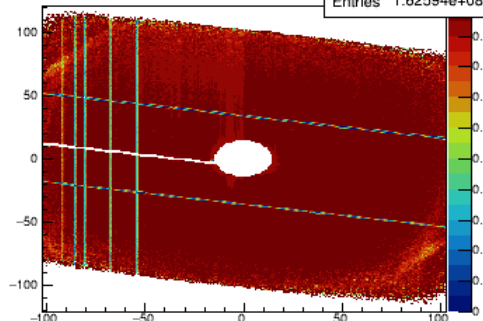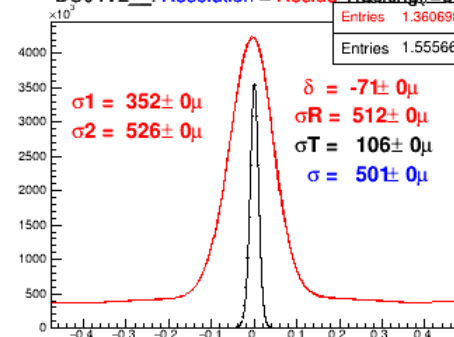
Entries 1.309624e+09
Entries 1.506739e+09

σ1 = 432± 0μ
σ2 = 648± 0μ
δ = -51± 0μ
σR = 517± 0μ
σT = 106± 0μ
σ = 506± 0μ

DC04V2 - 0x847 - #287315

DC04V2__: Efficiency-Background (6σ) = 95.61±0.00%

Entries 1.62594e+08

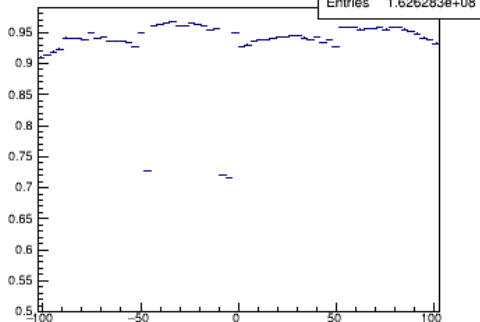DC04V2__: Resolution = Residu-Tracking(/=60)

Entries 1.360698e+09
Entries 1.55566e+09

σ1 = 352± 0μ
σ2 = 526± 0μ
δ = -71± 0μ
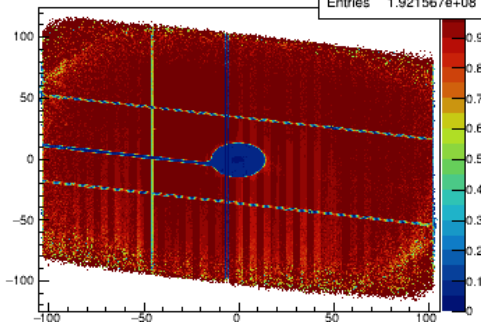σR = 512± 0μ
σT = 106± 0μ
σ = 501± 0μ

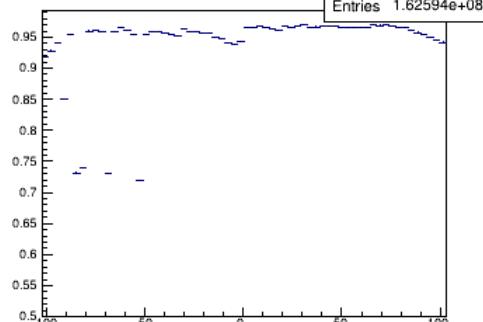DC04V1__: Efficiency-Background (6σ) = 92.54±0.00%

Entries 1.626283e+08

DC04V1__: Efficiency × Acceptance (6σ) = 79.89±0.00%
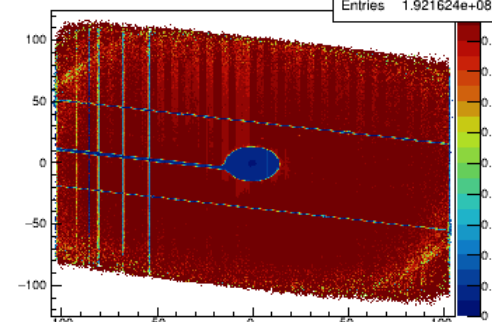
Entries 1.921567e+08
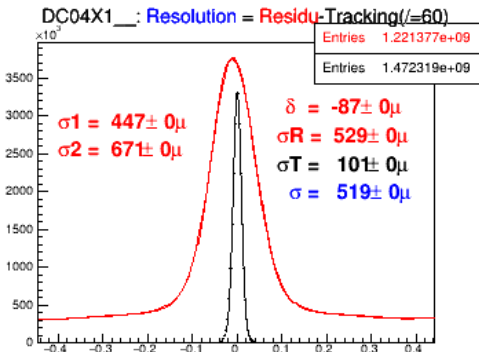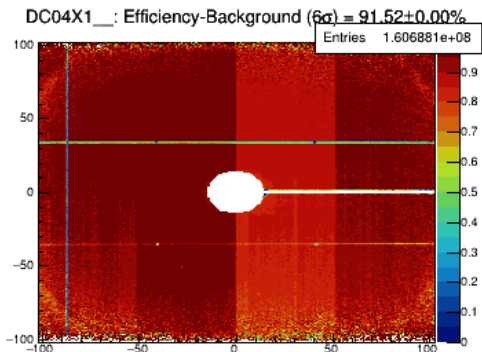
DC04V2__: Efficiency-Background (6σ) = 95.61±0.00%

Entries 1.62594e+08

DC04V2__: Efficiency × Acceptance (6σ) = 82.63±0.00%

Entries 1.921624e+08
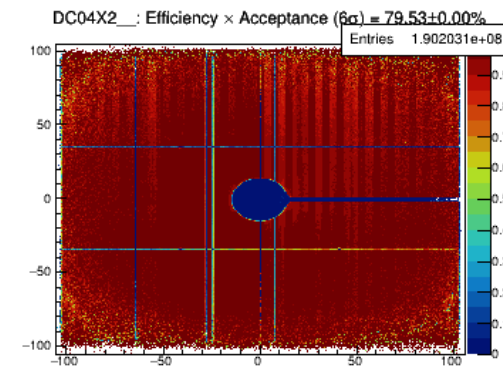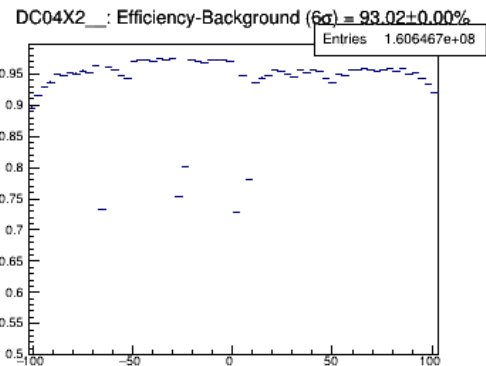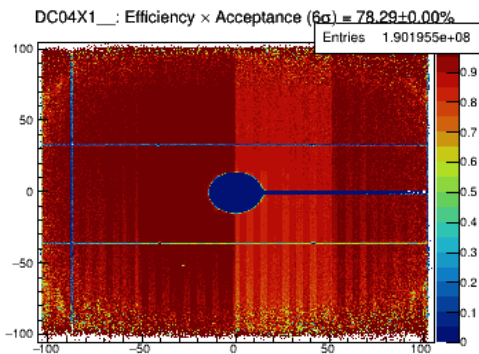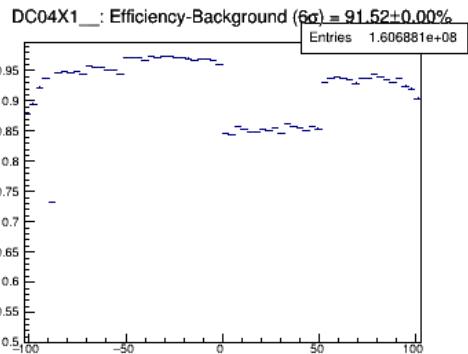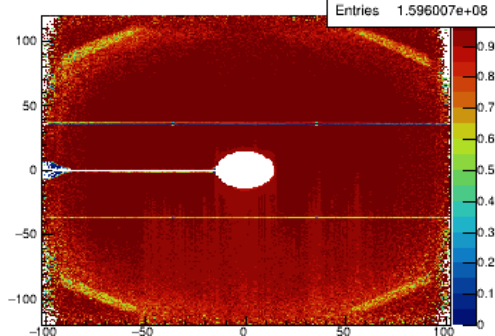
DC04X1 - 0x847 - #287315

DC04X1__: Efficiency-Background (6σ) = 91.52±0.00%

DC04X1__: Resolution = Residu-Tracking(/=60)

σ1 = 447± 0μ
σ2 = 671± 0μ

δ = -87± 0μ
σR = 529± 0μ
σT = 101± 0μ
σ = 519± 0μ

DC04X1__: Efficiency-Background (6σ) = 91.52±0.00%

DC04X1__: Efficiency × Acceptance (6σ) = 78.29±0.00%

DC04X2 - 0x847 - #287315

DC04X2__: Efficiency-Background (6σ) = 93.02±0.00%

DC04X2__: Resolution = Residu-Tracking(/=60)

σ1 = 434± 0μ
σ2 = 651± 0μ

δ = -57± 0μ
σR = 515± 0μ
σT = 102± 0μ
σ = 505± 0μ

DC04X2__: Efficiency-Background (6σ) = 93.02±0.00%
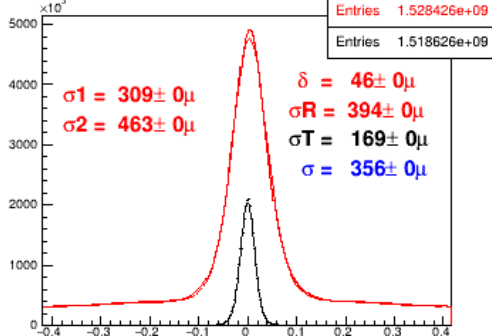
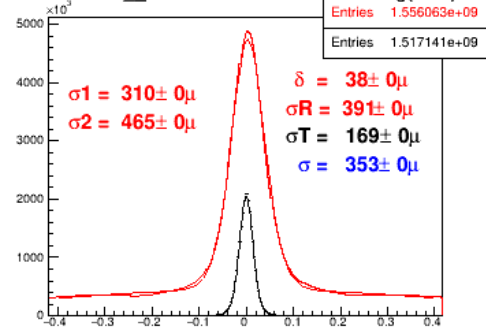DC04X2__: Efficiency × Acceptance (6σ) = 79.53±0.00%

DC04Y1 - 0x847 - #287315

DC04Y1__: Efficiency-Background (6σ) = 95.07±0.00%
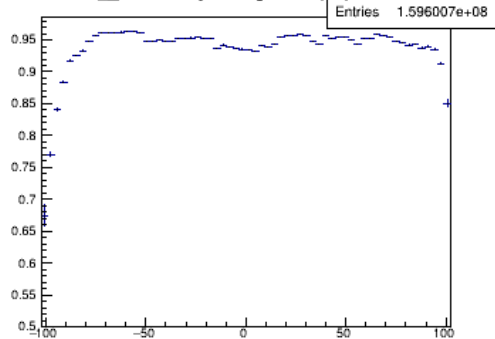
DC04Y1__: Resolution = Residu-Tracking(/=60)

$\sigma 1 = 309\pm 0\mu$
$\sigma 2 = 463\pm 0\mu$
$\delta = 46\pm 0\mu$
$\sigma R = 394\pm 0\mu$
$\sigma T = 169\pm 0\mu$
$\sigma = 356\pm 0\mu$

DC04Y1__: Efficiency-Background (6σ) = 95.07±0.00%

DC04Y1__: Efficiency × Acceptance (6σ) = 80.99±0.00%

DC04Y2 - 0x847 - #287315

DC04Y2__: Efficiency-Background (6σ) = 95.01±0.00%
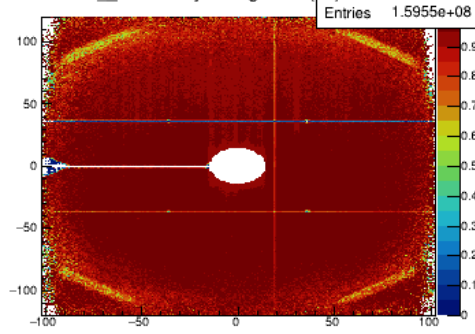
DC04Y2__: Resolution = Residu-Tracking(/=60)

$\sigma 1 = 310\pm 0\mu$
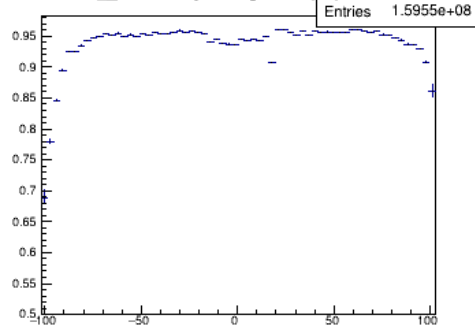$\sigma 2 = 465\pm 0\mu$
$\delta = 38\pm 0\mu$
$\sigma R = 391\pm 0\mu$
$\sigma T = 169\pm 0\mu$
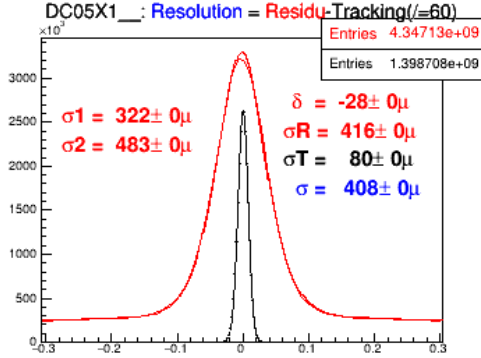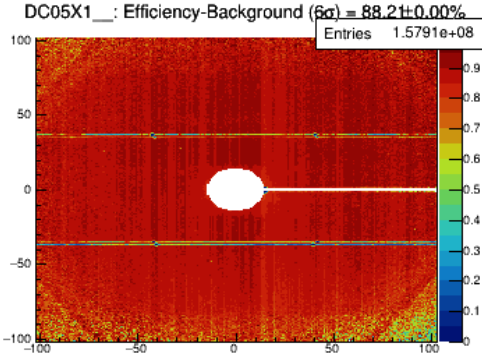$\sigma = 353\pm 0\mu$
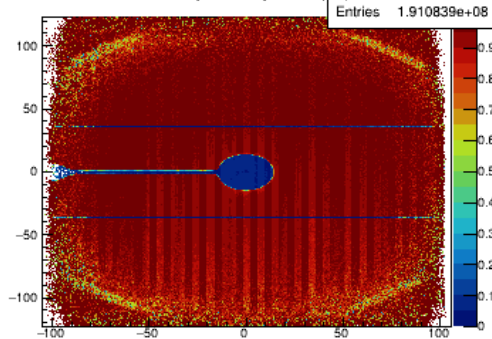
DC04Y2__: Efficiency-Background (6σ) = 95.01±0.00%

DC04Y2__: Efficiency × Acceptance (6σ) = 81.14±0.00%
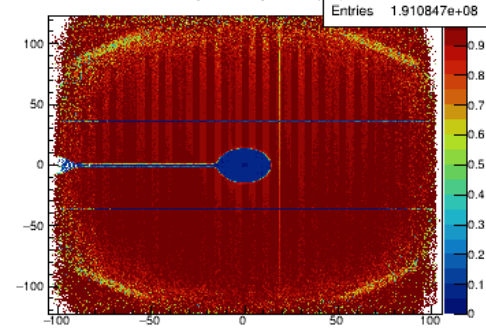
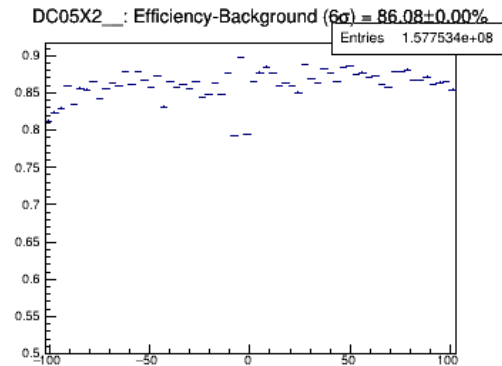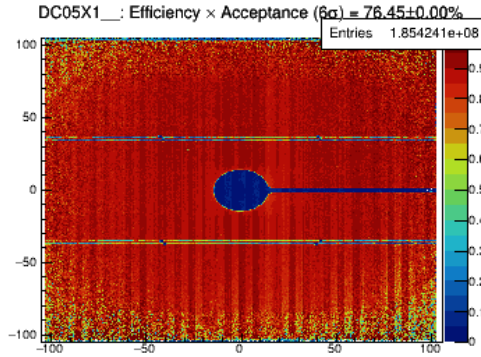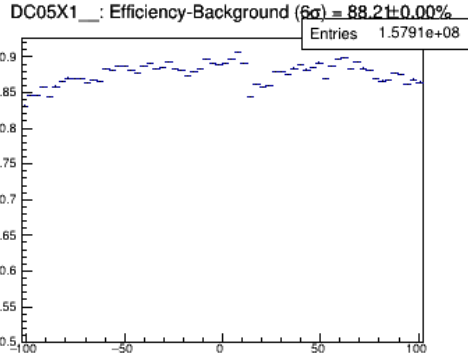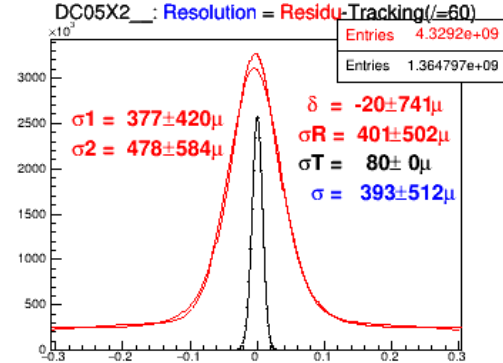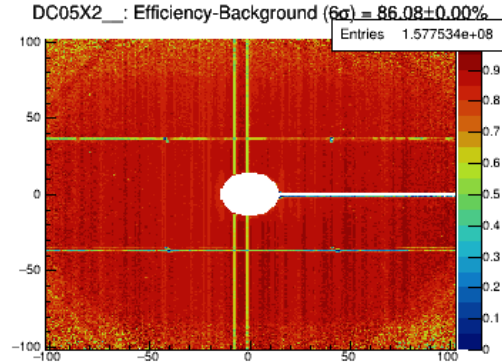From DC05 planes, there was a problem in the phast U11 step, causing merging problem of the files. Some results for X and Y planes, not for U and V (this step must be repeated for all planes of DC05)

Problem of merging of files. U11 step must be repeated.
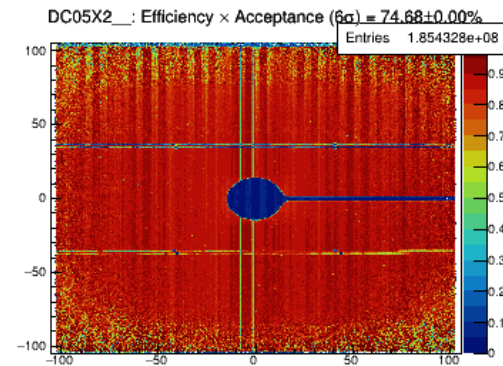
Plane DC05Y2 was broken.
There is a problem of merging of files for DC05Y1. U11 step to be repeated.
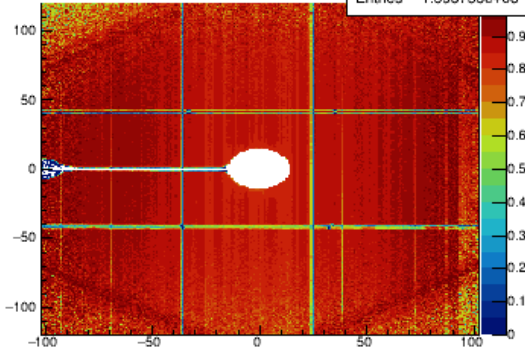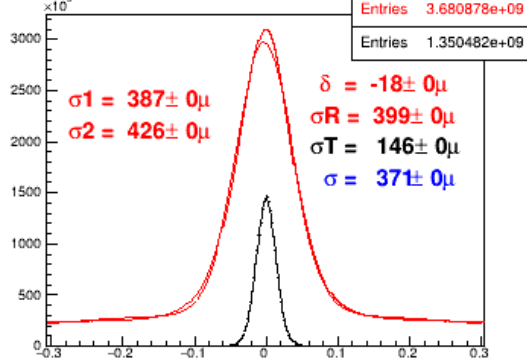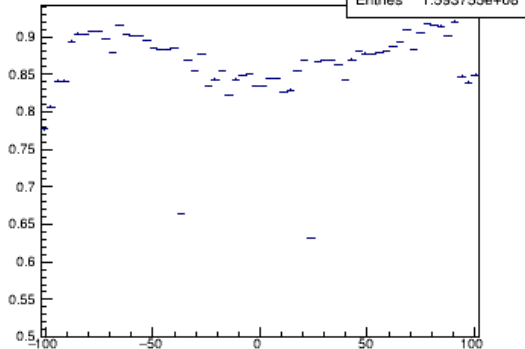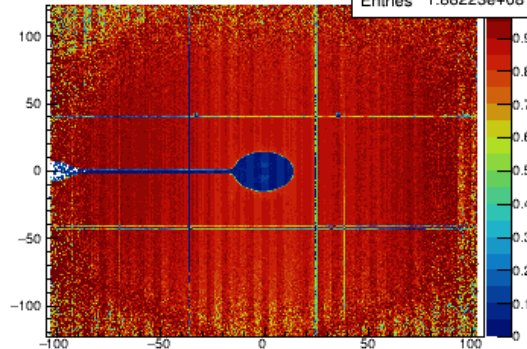
DCs: Comparison with single-plane space resolution in detectors.dat (micron)

	DC00X1	DC00X2	DC00Y1	DC00Y2	DC00U1	DC00U2	DC00V1	DC00V2
AnalyzeDC	606	571	529	514	661	661		
Det.dat	292	292	281	281	288	288	289	289

	DC01X1	DC01X2	DC01Y1	DC01Y2	DC01U1	DC01U2	DC01V1	DC01V2
AnalyzeDC	411	388	479	505	438	428	433	460
Det.dat	289	289	299	299	262	262	245	245

	DC04X1	DC04X2	DC04Y1	DC04Y2	DC04U1	DC04U2	DC04V1	DC04V2
AnalyzeDC	519	505	356	353	552	437	506	501
Det.dat	322	322	303	303	286	286	343	343

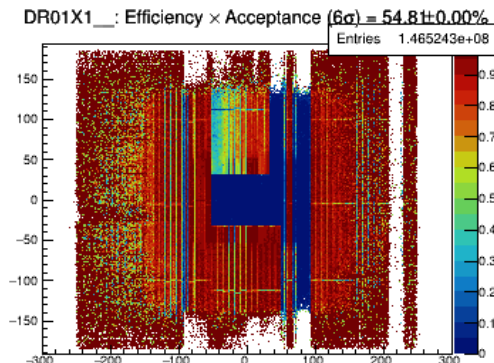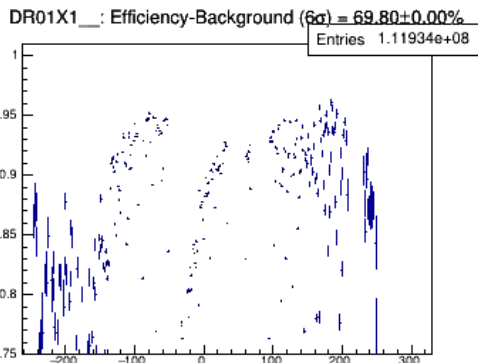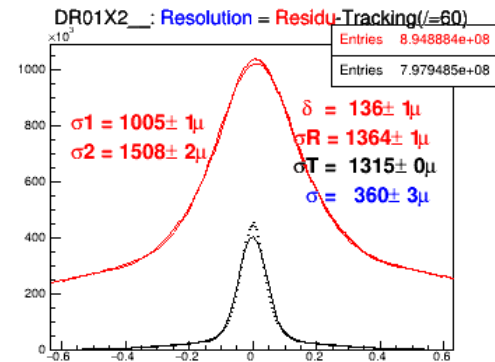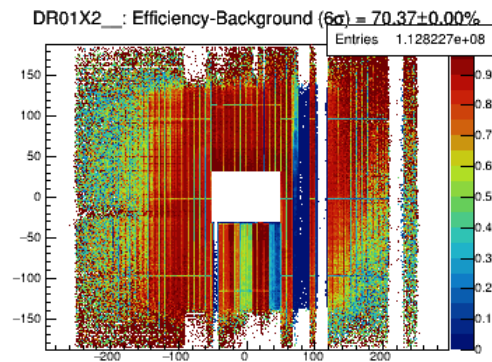|	DC05X1	DC05X2	DC05Y1	DC05Y2	DC05U1	DC05U2	DC05V1	DC05V2
AnalyzeDC	408	393	371					
Det.dat	221	221	221	221	221	221	221	221

But are the detectors.dat values for DCs having an impact in DY RD reconstruction?

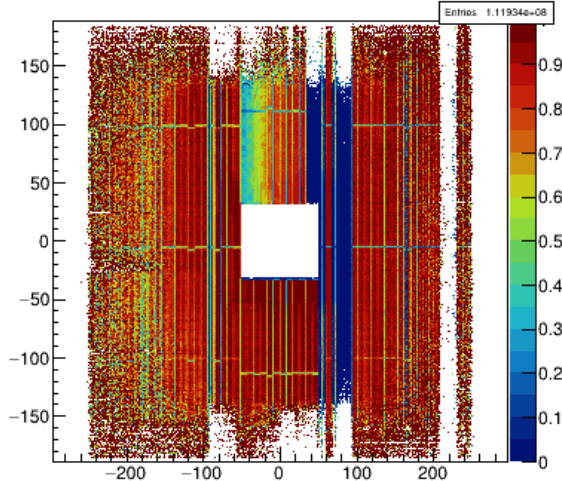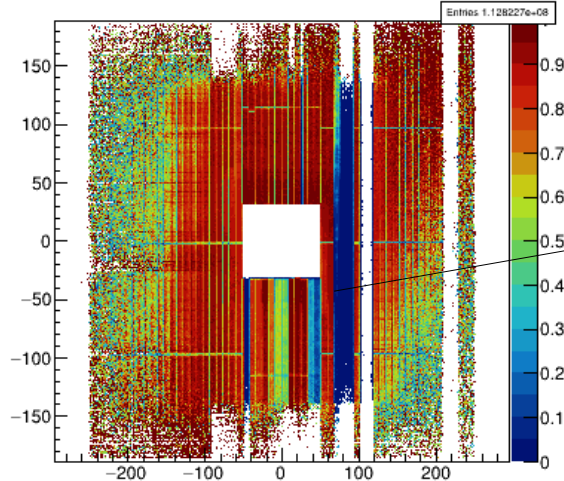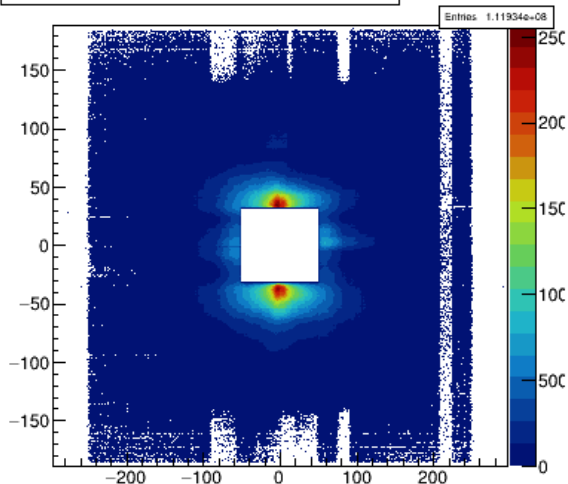# What is happening with track resolution when probing Rich Wall??
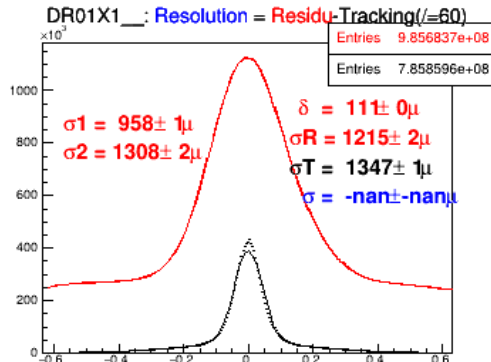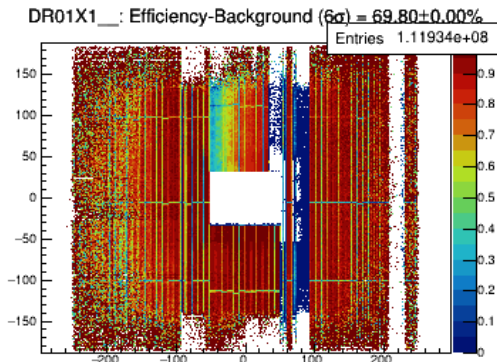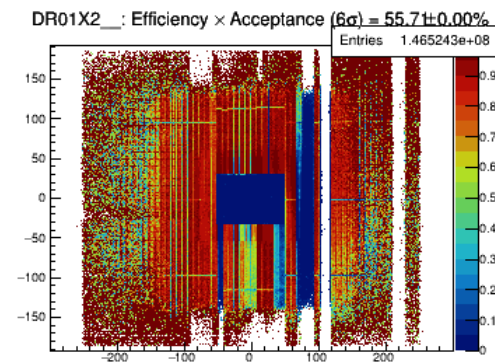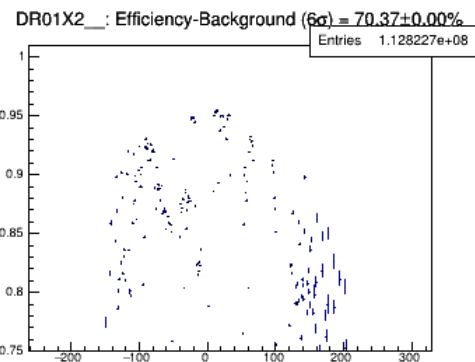
DR01X1__ : Eff. = 0.70997 ± 0.00015

DR01X2__ : Eff. = 0.61525 ± 0.00015

An efficiency problem

DR01X1__: Expected (χ^2<4.0NDF,0x0847)

DR01X2__: Expected (χ^2<4.0NDF,0x0847)
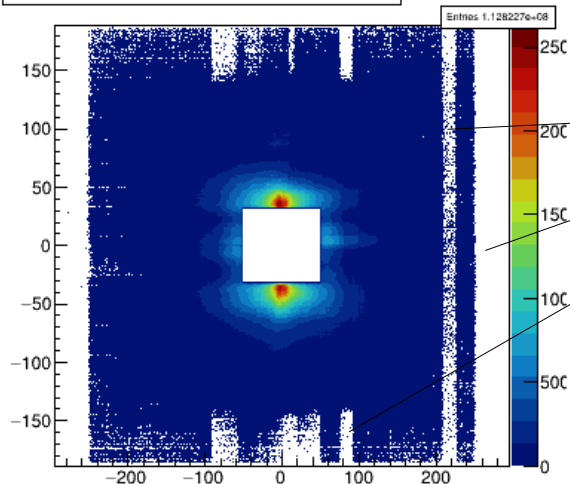
A local lack of redundancy problem?