

Baffle update

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What's compared

They are all in current CLEO field

- “CLEO baffle 4cm” current baffle
- “BaBar baffle” from Eugene
- “BaBar baffle more” by Rakitha, based on “BaBar baffle” and add 5 planes to be 11 total
- “BaBar baffle more1” by Zhiwen, based on “BaBar baffle more”, add 1 more degree in ϕ for each blocks

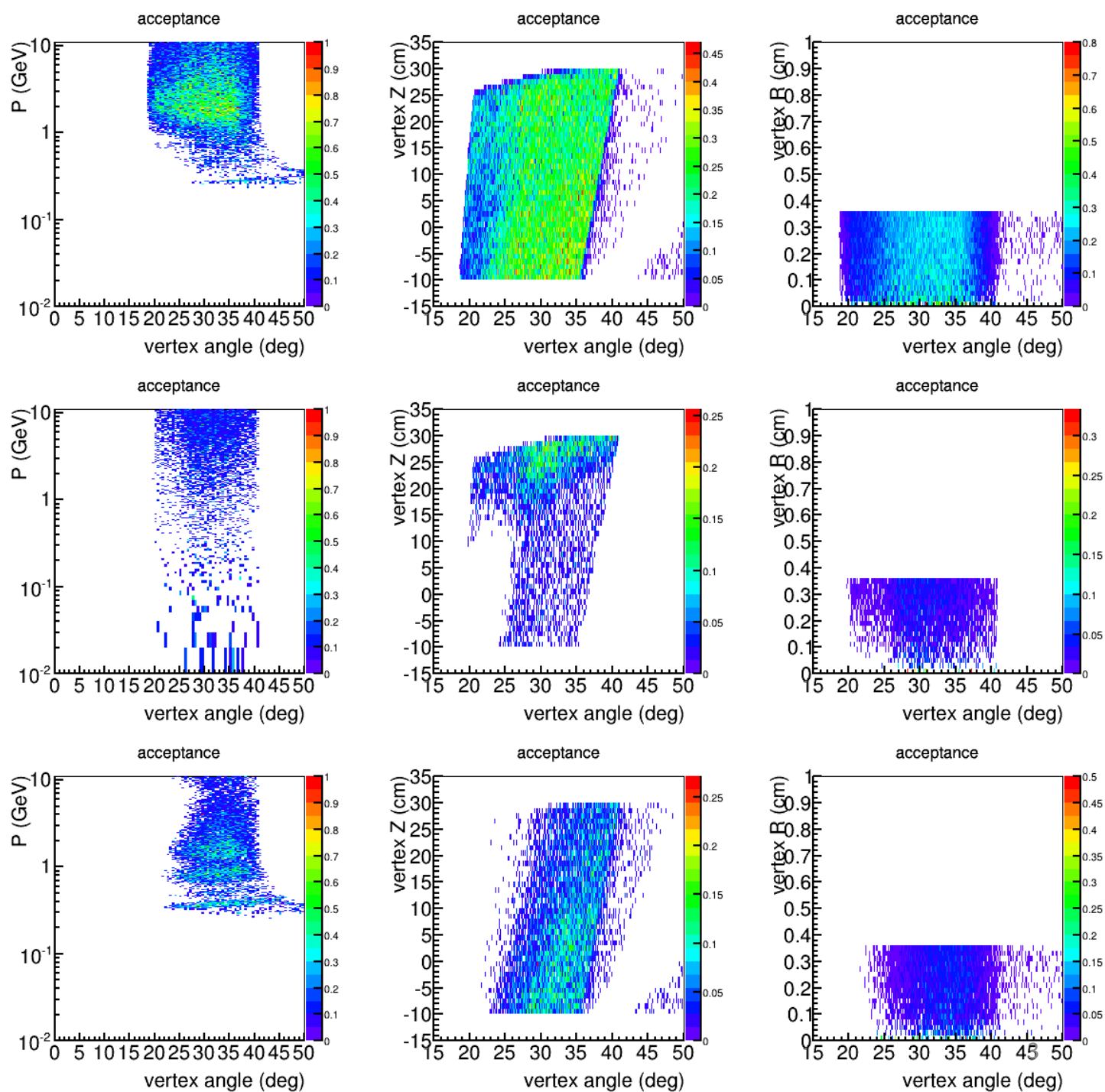
Acceptance,
CLEO baffle 4cm

negative

source
Z(-10,30)cm
R(0,3.536)mm
for 5x5mm raster

neutral

positive



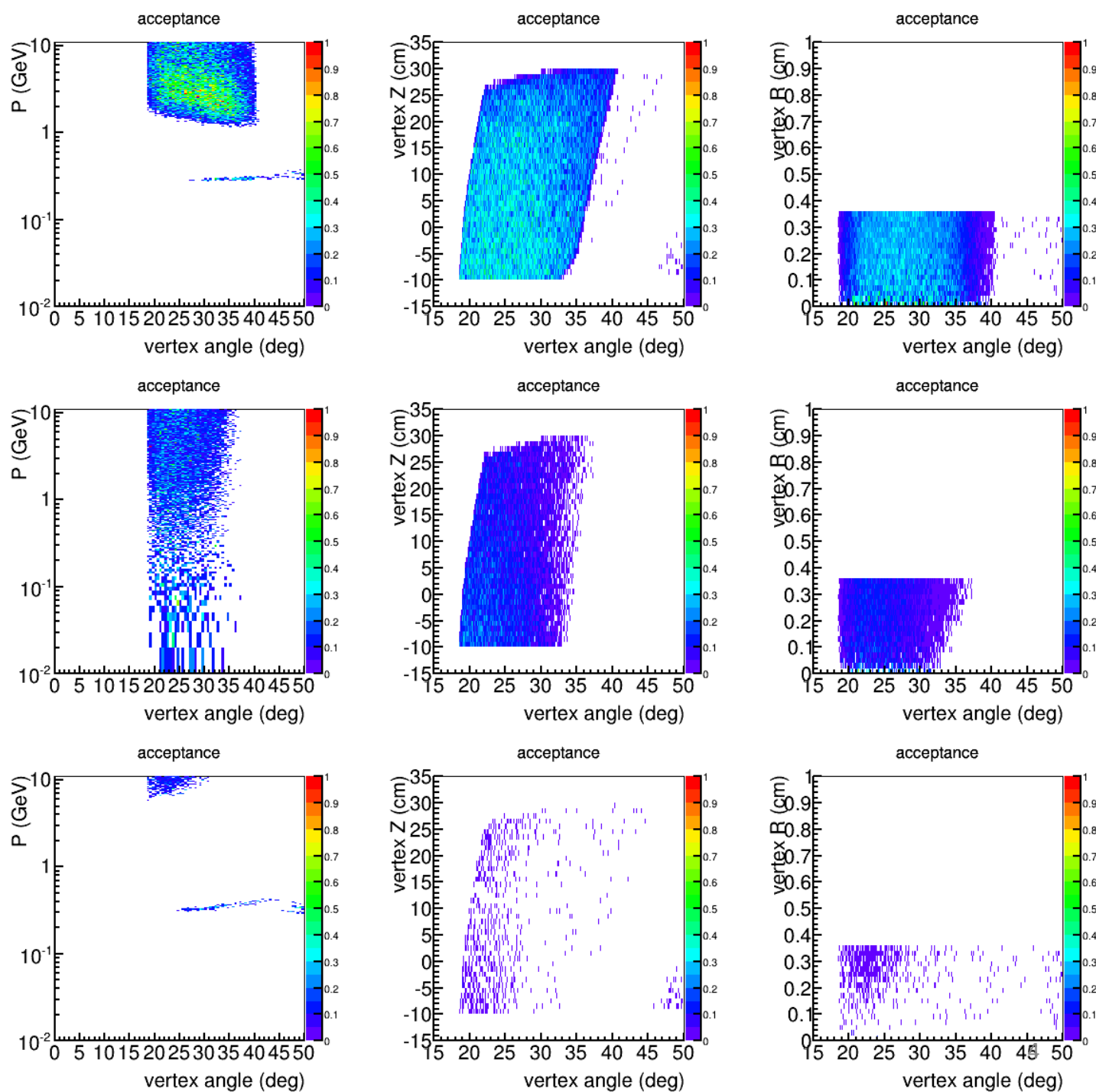
Acceptance,
BaBar baffle

negative

source
Z(-10,30)cm
R(0,3.536)mm
for 5x5mm raster

neutral

positive



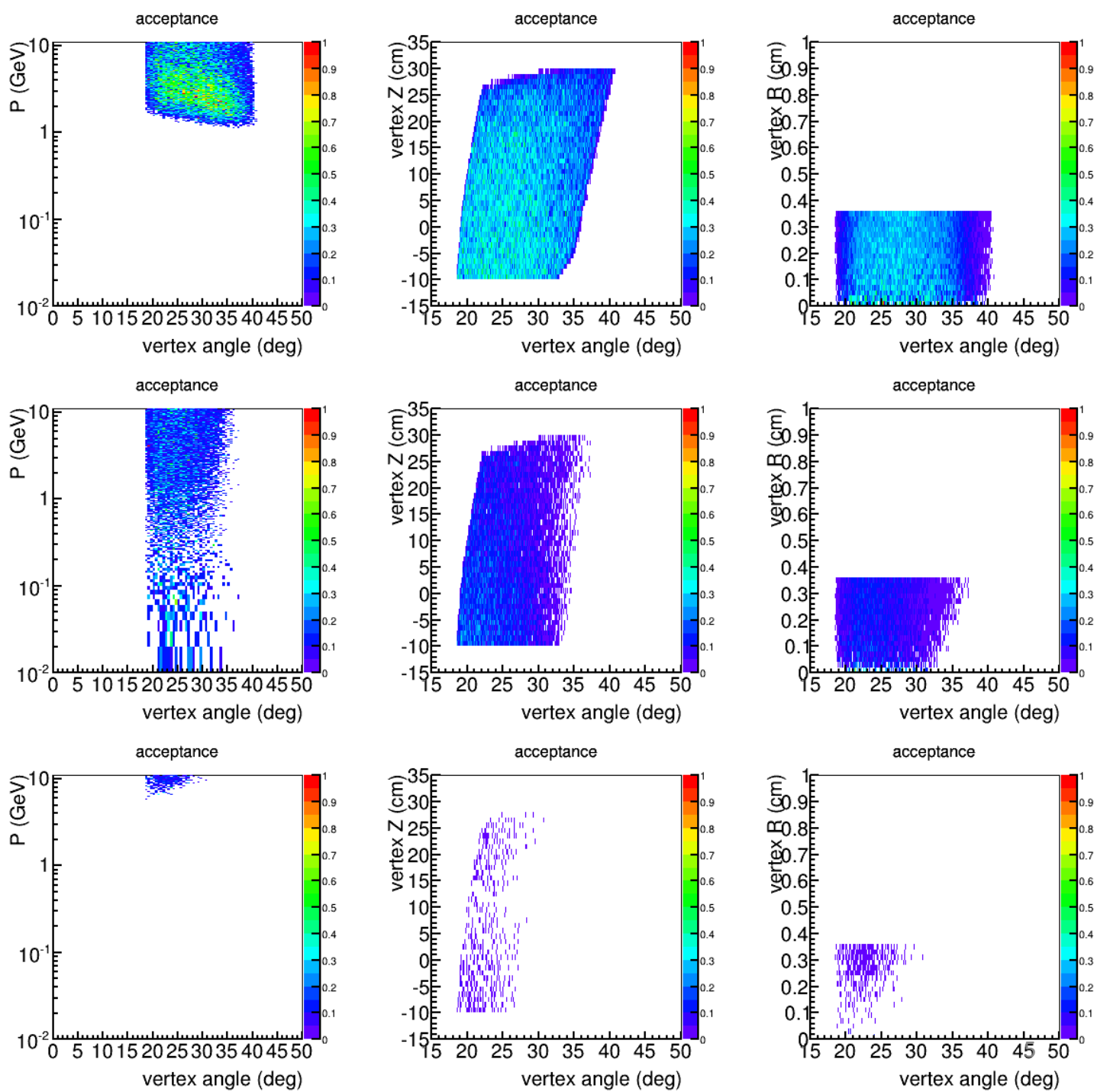
Acceptance,
BaBar baffle more

negative

source
Z(-10,30)cm
R(0,3.536)mm
for 5x5mm raster

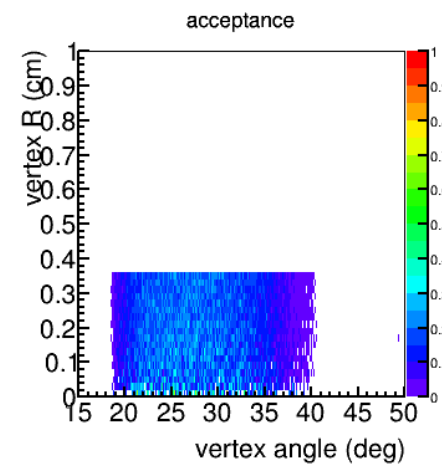
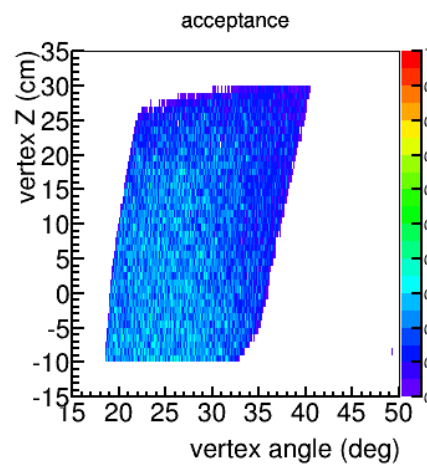
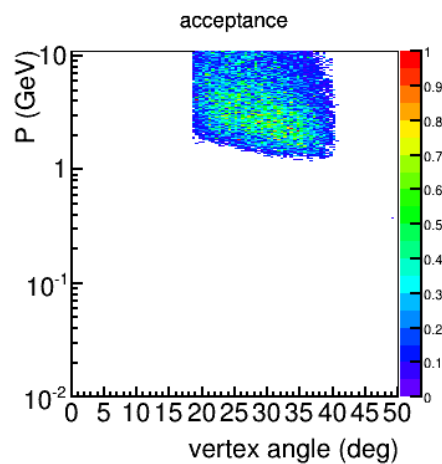
neutral

positive



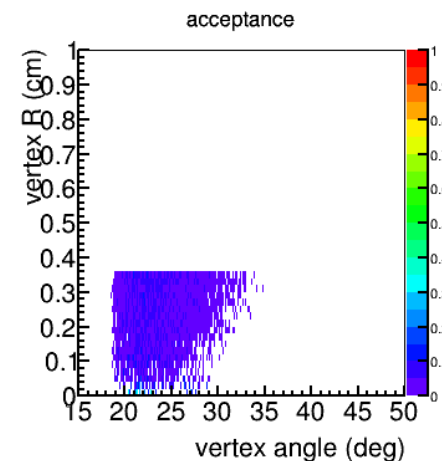
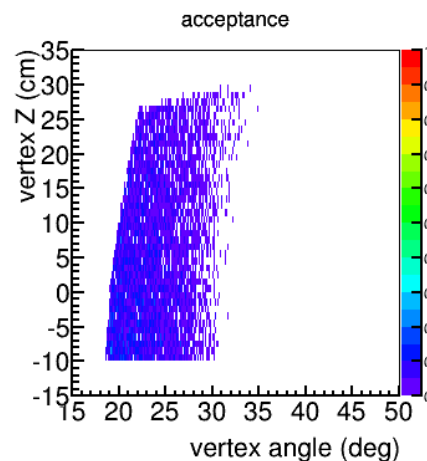
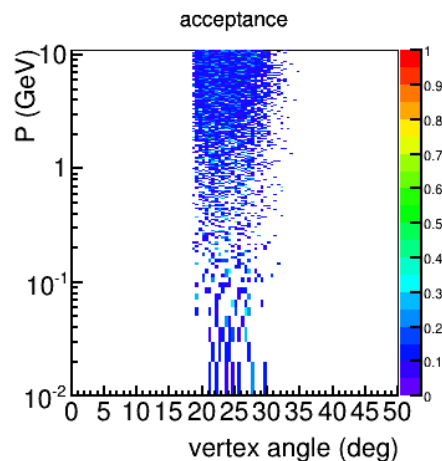
Acceptance,
BaBar baffle more1

negative

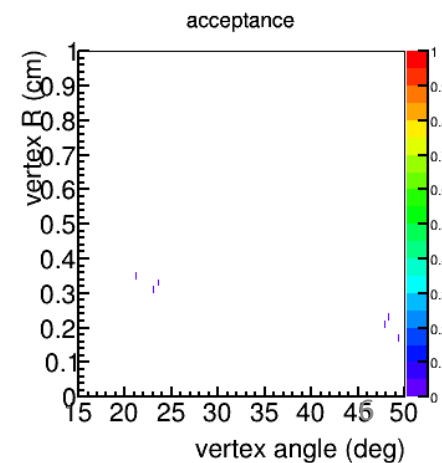
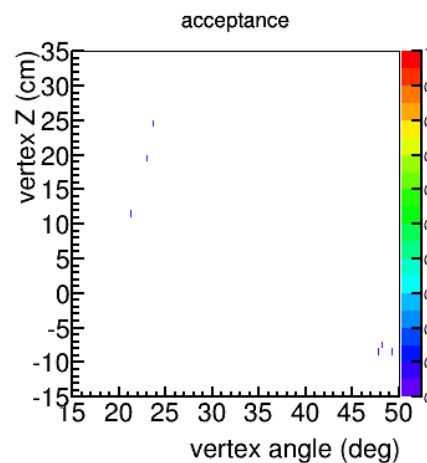
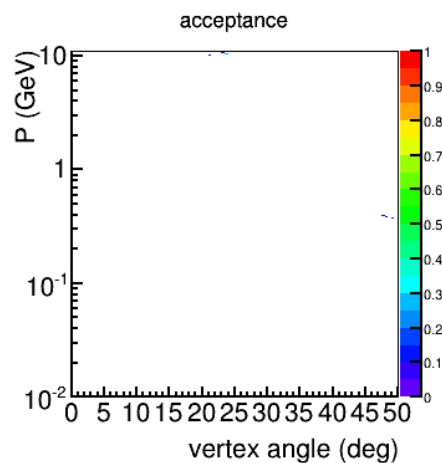


source
Z(-10,30)cm
R(0,3.536)mm
for 5x5mm raster

neutral



positive



EM photon Rate (GHz)

EC	Full		High	
	E>~10KeV	E>10MeV	E>~10KeV	E>10MeV
BaBar baffle	5.71e2	5.63	4.46e2	2.82
BaBar baffle more	5.04e2	4.70	4.20e2	2.82
BaBar baffle more1	2.51e2	1.56	1.98e2	0.94
CLEO baffle 4cm	5.15e2	10.6	3.07e2	8.12

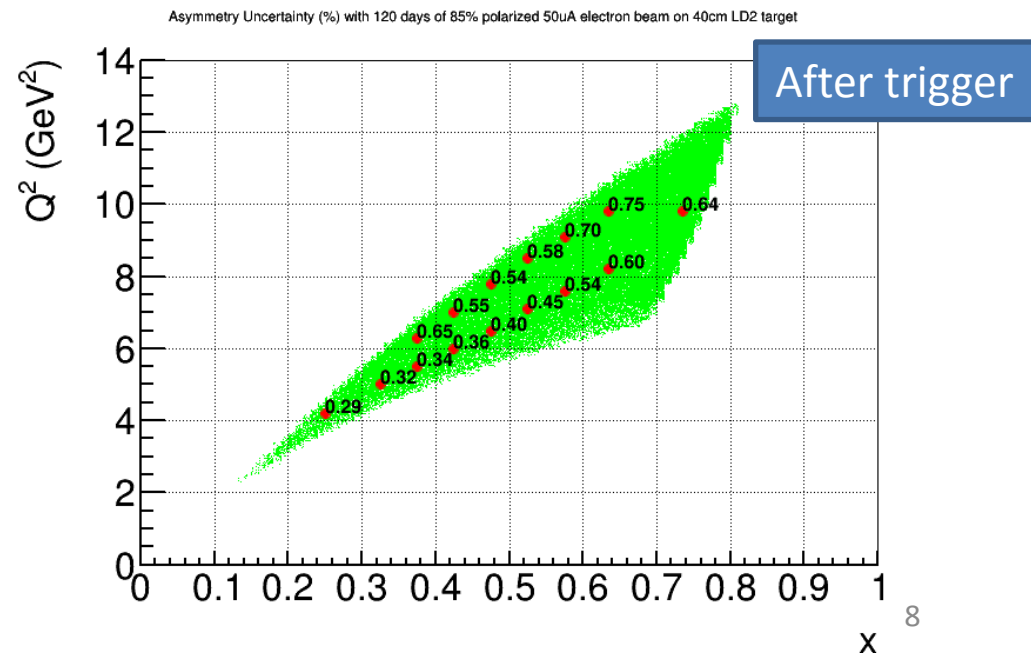
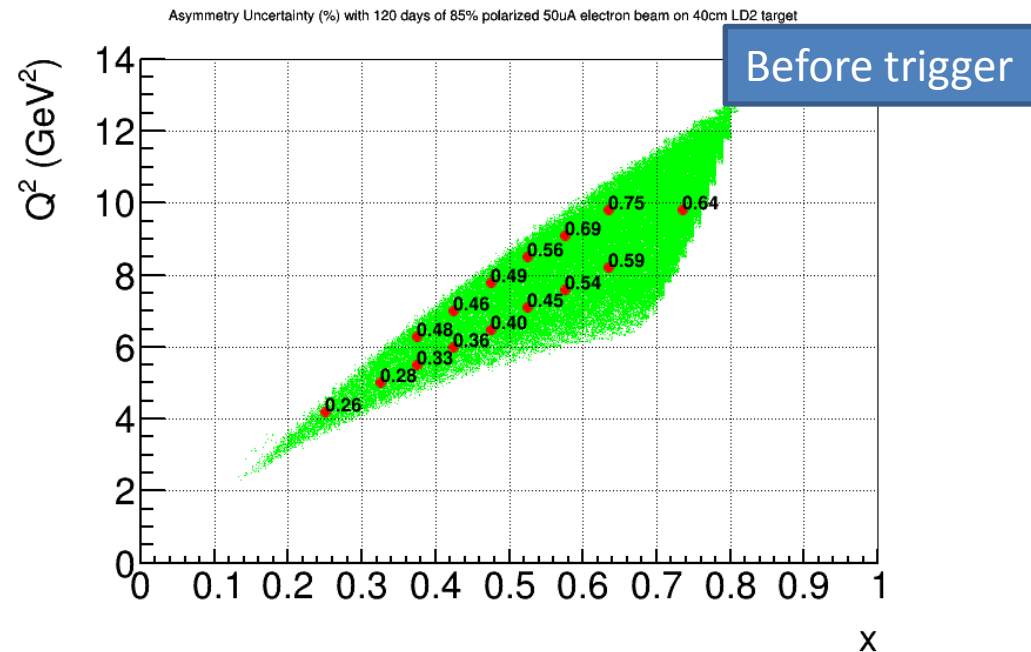
Cherenkov	Full		High	
	E>~10KeV	E>10MeV	E>~10KeV	E>10MeV
BaBar baffle	6.49e2	5.61	5.27e2	3.42
BaBar baffle more	5.82e2	5.31	4.95e2	3.13
BaBar baffle more1	2.99e2	1.86	2.40e2	1.86
CLEO baffle 4cm	6.26e2	10.5	3.65e2	7.44

Rate has distribution over phi angle every 12 degree, we take 0-6 degree as high rate area and 6-12 degree as low rate area. The full rate area include both

Result with E>10MeV cut is limited in statistics

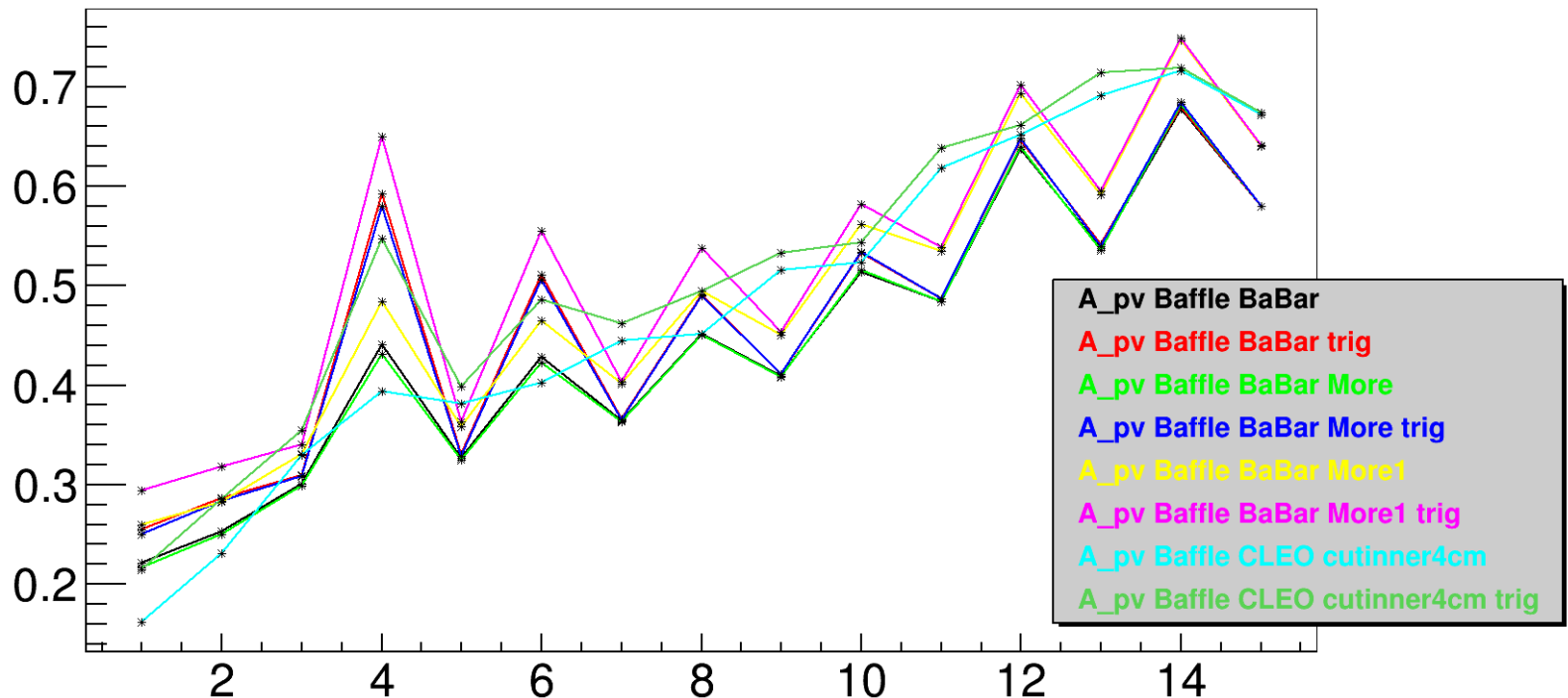
Err_Apv(%)

- “BaBar baffle more1”
- Before and after trigger
- 15 points in Q^2, x plane



Err_Apv(%)

- 15 points in Q2,x plane, x and Q2 increase from low to high in X-axis
- Including untrig and trig result, the cut mainly affect things at lower x and Q2
- “CLEO baffle 4cm” is worse, “BaBar baffle” and “BaBar baffle more” are similar, “BaBar baffle more1” is inbetween



How to read the rate table on next two slides

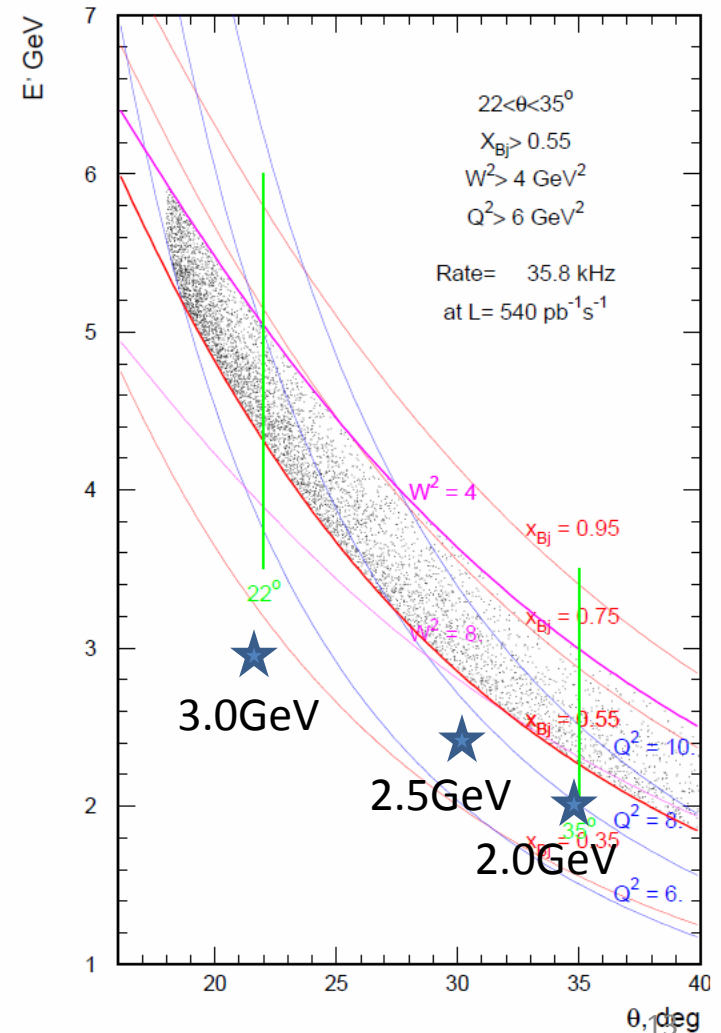
- All rate are in kHz
- All rate on whole EC plane, divide by 30 to get sector rate
- Top section is without trig cut, bottom section is with trig cut
- Rate has distribution over phi angle every 12 degree, we take 0-6 degree as high rate area and 6-12 degree as low rate area. The full rate area include both
- The last row of total rate with * has additional 5% eff cut on gamma from π^0
- The difference between the two tables are “more” and “more1” baffle

Rate (kHz)		Baffle BaBar			Baffle BaBar More			Baffle CLEO 4cm		
		full	High	Low	full	High	Low	full	High	Low
e DIS	kry	633	273	360	639	282	358	1140	525	615
π^-	Kry	2.25e5	1.31e5	0.94e5	7.83e4	0.61e5	1.73e4	1.07e6	0.60e6	4.65e5
	lead	2.94e6	1.50e6	1.43e6	7.92e5	4.48e5	3.43e5	6.69e6	3.44e6	3.25e6
π^+	Kry	1.92e5	1.32e5	0.60e5	1.25e4	0.64e4	0.60e4	1.38e6	0.72e6	0.67e6
	lead	3.28e6	1.68e6	1.60e6	3.60e5	1.74e5	1.85e5	7.68e6	3.82e6	3.86e6
$\gamma(\pi^0)$	kry	3.72e6	3.72e6	0	3.25e6	3.25e6	0	1.35e6	4.17e5	0.93e6
ρ	Kry	5.23e4	2.63e4	2.60e4	3.65e3	1.80e3	1.84e3	9.14e5	4.3e5	4.83e5
	lead	5.59e5	2.75e5	2.84e5	9.50e4	4.60e4	4.9e4	2.39e6	1.20e6	1.20e6
Total (lead)		10.05e6	7.18e6	3.32e6	4.41e6	3.87e6	0.53e6	18.11e6	8.87e6	9.25e6
e DIS	kry	519	180	340	531	187	343	639	246	392
π^-	Kry	7.38e3	0.52e4	2.04e3	7.88e3	0.57e4	2.11e3	3.34e4	1.98e4	1.35e4
	lead	4.32e4	2.70e4	1.72e4	2.60e4	1.69e4	0.90e4	1.03e5	0.57e5	4.57e4
π^+	Kry	0	0	0	0	0	0	1.49e4	0.72e4	0.77e4
	lead	2.75e4	1.41e4	1.35e4	4.41e3	1.93e3	2.48e3	8.03e4	4.00e4	4.03e4
$\gamma(\pi^0)$	kry	7.69e4	7.70e4	0	7.5e4	0.75e5	0	9.75e3	0.67e4	3.09e3
ρ	Kry	0	0	0	0	0	0	1.10e4	0.50e4	0.60e4
	lead	8.75e3	4.27e3	4.47e3	1.76e3	0.82e3	0.94e3	3.37e4	1.65e4	1.72e4
Total (lead)		15.64e4	12.14e4	3.50e4	10.72e4	9.47e4	1.25e4	22.41e4	12.02e4	10.63e4
Total (lead) *		8.33e4	4.82e4	3.50e4	3.59e4	2.34e4	1.25e4	21.75e4	11.35e4	¹¹ 10.33e4

Rate (kHz)		Baffle BaBar			Baffle BaBar More1			Baffle CLEO 4cm		
		full	High	Low	full	High	Low	full	High	Low
e DIS	kry	633	273	360	469	205	264	1140	525	615
π^-	Kry	2.25e5	1.31e5	0.94e5	5.29e4	4.11e4	1.18e4	1.07e6	0.60e6	4.65e5
	lead	2.94e6	1.50e6	1.43e6	5.45e5	3.15e5	2.30e5	6.69e6	3.44e6	3.25e6
π^+	Kry	1.92e5	1.32e5	0.60e5	2.27e4	1.00e4	1.27e4	1.38e6	0.72e6	0.67e6
	lead	3.28e6	1.68e6	1.60e6	2.13e5	1.04e5	1.08e5	7.68e6	3.82e6	3.86e6
$\gamma(\pi^0)$	kry	3.72e6	3.72e6	0	1.20e6	1.20e6	0	1.35e6	4.17e5	0.93e6
ρ	Kry	5.23e4	2.63e4	2.60e4	3.65e3	1.80e3	1.85e3	9.14e5	4.3e5	4.83e5
	lead	5.59e5	2.75e5	2.84e5	5.49e4	2.65e4	2.84e3	2.39e6	1.20e6	1.20e6
Total (lead)		10.05e6	7.18e6	3.32e6	2.01e6	1.64e6	0.36e6	18.11e6	8.87e6	9.25e6
e DIS	kry	519	180	340	403	145	258	639	246	392
π^-	Kry	7.38e3	0.52e4	2.04e3	5.22e3	4.00e3	1.22e3	3.34e4	1.98e4	1.35e4
	lead	4.32e4	2.70e4	1.72e4	1.87e4	1.26e4	0.60e4	1.03e5	0.57e5	4.57e4
π^+	Kry	0	0	0	0	0	0	1.49e4	0.72e4	0.77e4
	lead	2.75e4	1.41e4	1.35e4	2.48e3	1.09e3	1.43e3	8.03e4	4.00e4	4.03e4
$\gamma(\pi^0)$	kry	7.69e4	7.70e4	0	3.22e4	3.22e4	0	9.75e3	0.67e4	3.09e3
ρ	Kry	0	0	0	0	0	0	1.10e4	0.50e4	0.60e4
	lead	8.75e3	4.27e3	4.47e3	957	475	481	3.37e4	1.65e4	1.72e4
Total (lead)		15.64e4	12.14e4	3.50e4	5.34e4	4.59e4	0.75e4	22.41e4	12.02e4	10.63e4
Total (lead) *		8.33e4	4.82e4	3.50e4	2.28e4	1.53e4	0.75e4	21.75e4	11.35e4	¹² 10.33e4

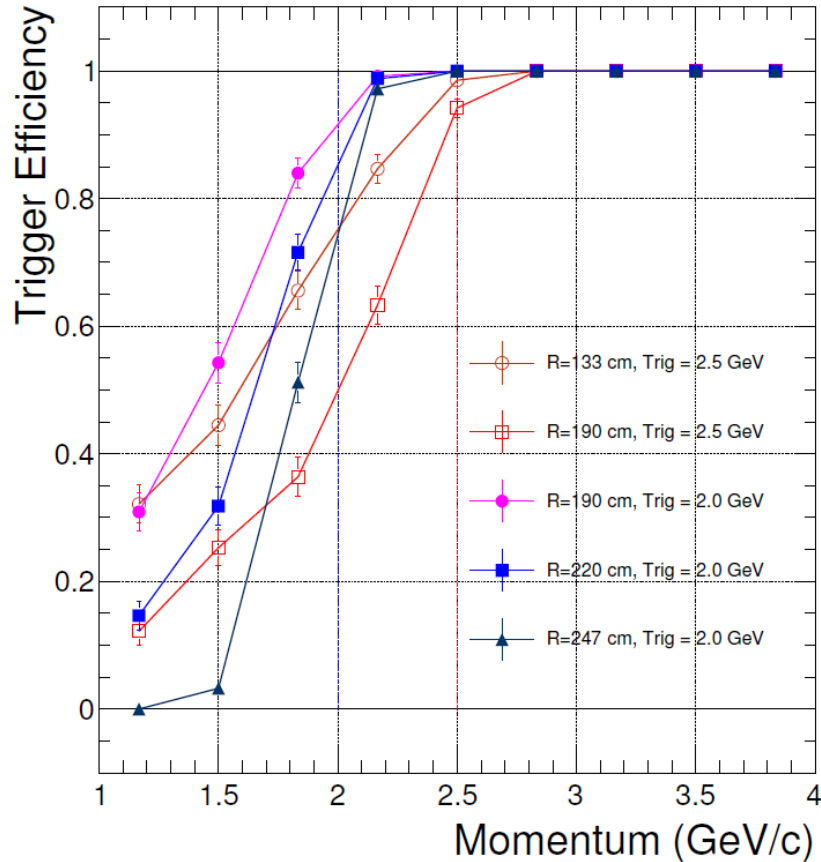
Trigger Rate Summary

- Max DAQ rate 65kHz per section
- We need at most 21MHz EC trigger rate, refer to $(21\text{e}6/30)*3\text{e}6*30\text{e}-9=63\text{kHz}$
- EC trigger rate (pion+gamma) for “BaBar baffle more1)
 - 53MHz with lead baffle
 - 23MHz with lead baffle if assume scintaltor plane can give 5% rejection on photon from π^0
- (p trigger is not right, ignore it for now)
- PVDIS EC Trigger Turn-on curve based on Kryptonite “CLEO baffle 4cm”

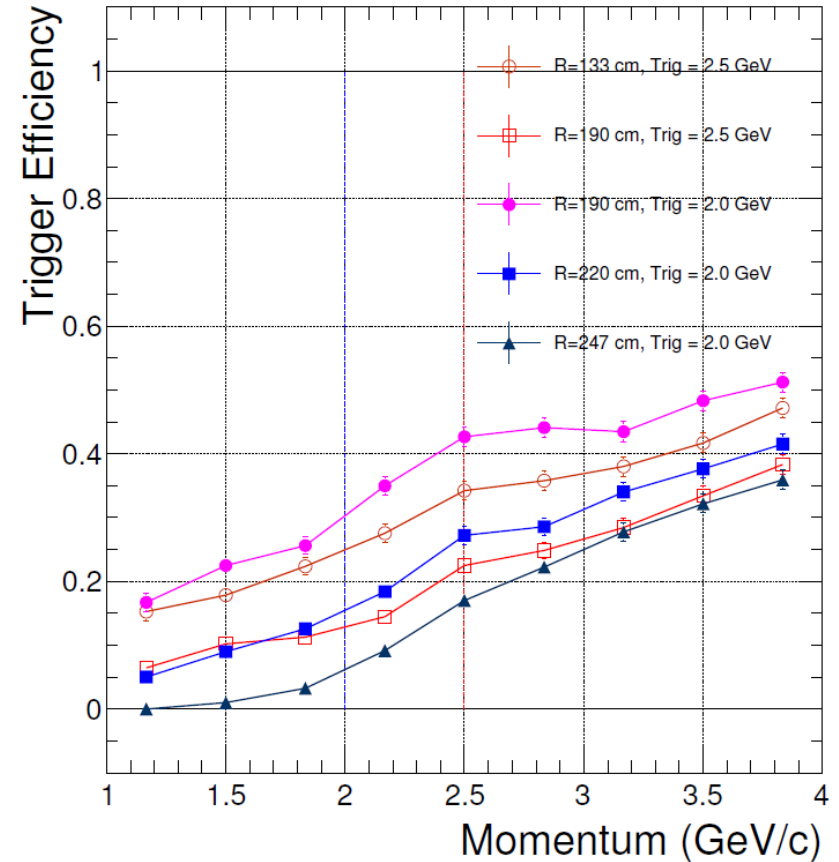


PVDIS EC Trigger Turn-on curve based on Kryptonite “CLEO baffle 4cm”

Electron



Pion



More plots are at

- http://hallaweb.jlab.org/12GeV/SoLID/download/baffle/talk/solid_baffle_zwzhao_20130829_plot/