

Update on multiplicity cumulants

w.j. llope, 4/23/2014

updated: 4/25/2014

Au+Au 14.5 GeV: test production QA and preliminary results

cf. http://wjlllope.rice.edu/fluct/protected/bulkcorr_20140319.pdf

Net-K in 2010&2011 data

cf. <http://arxiv.org/abs/1210.7023>

see also http://mac8.rice.edu/fluct/protected/bulkcorr_20140319.pdf

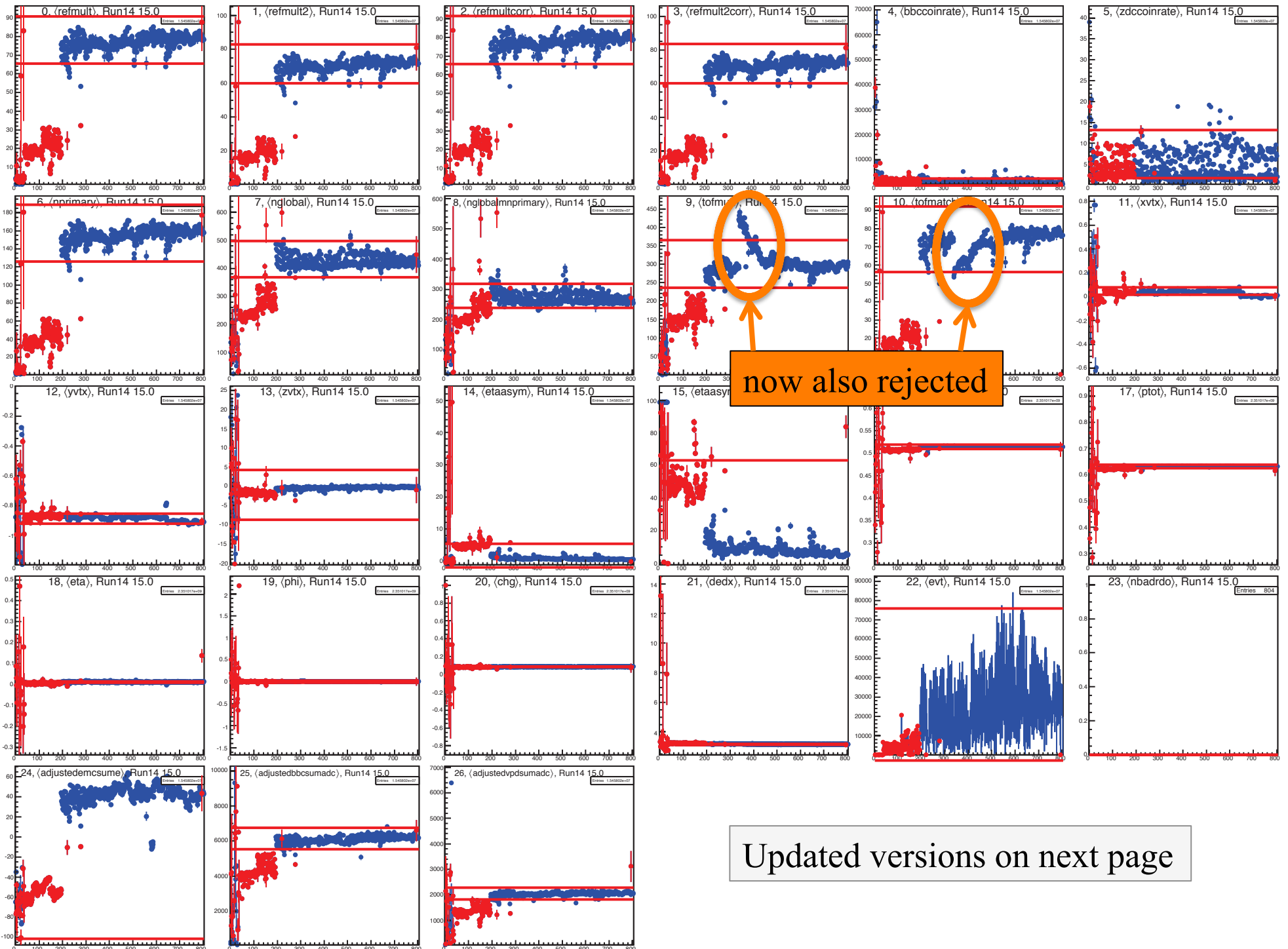
TRIGGER LABEL	DAQ TRIGGER ID(s)	OFFLINE TRIGGER ID(s)	PLOT	RUNS WITH TRG	EVENTS	EVENTS, readable	EVENTS, % of total
BBC_mb	10000	8		3	601	601	0%
BBC_mb	10000	440005	[CP]	147	21781307	21.78 M	6.2%
BBC_mb	8000	440015	[CP]	752	180058858	180.06 M	51.7%
<i>Total BBC_mb (3 versions)</i>						<i>201.84 M</i>	<i>57.92%</i>
BBC_mb-hltgood	2000	6	[CP]	269	26208012	26.21 M	7.5%
BBC_mb-hltgood	2000	7	[CP]	252	10121267	10.12 M	2.9%
<i>Total BBC_mb-hltgood (2 versions)</i>						<i>36.33 M</i>	<i>10.42%</i>

now looking at full “test production” triggers used: (**BBC_mb || bbc_mon_tof**)

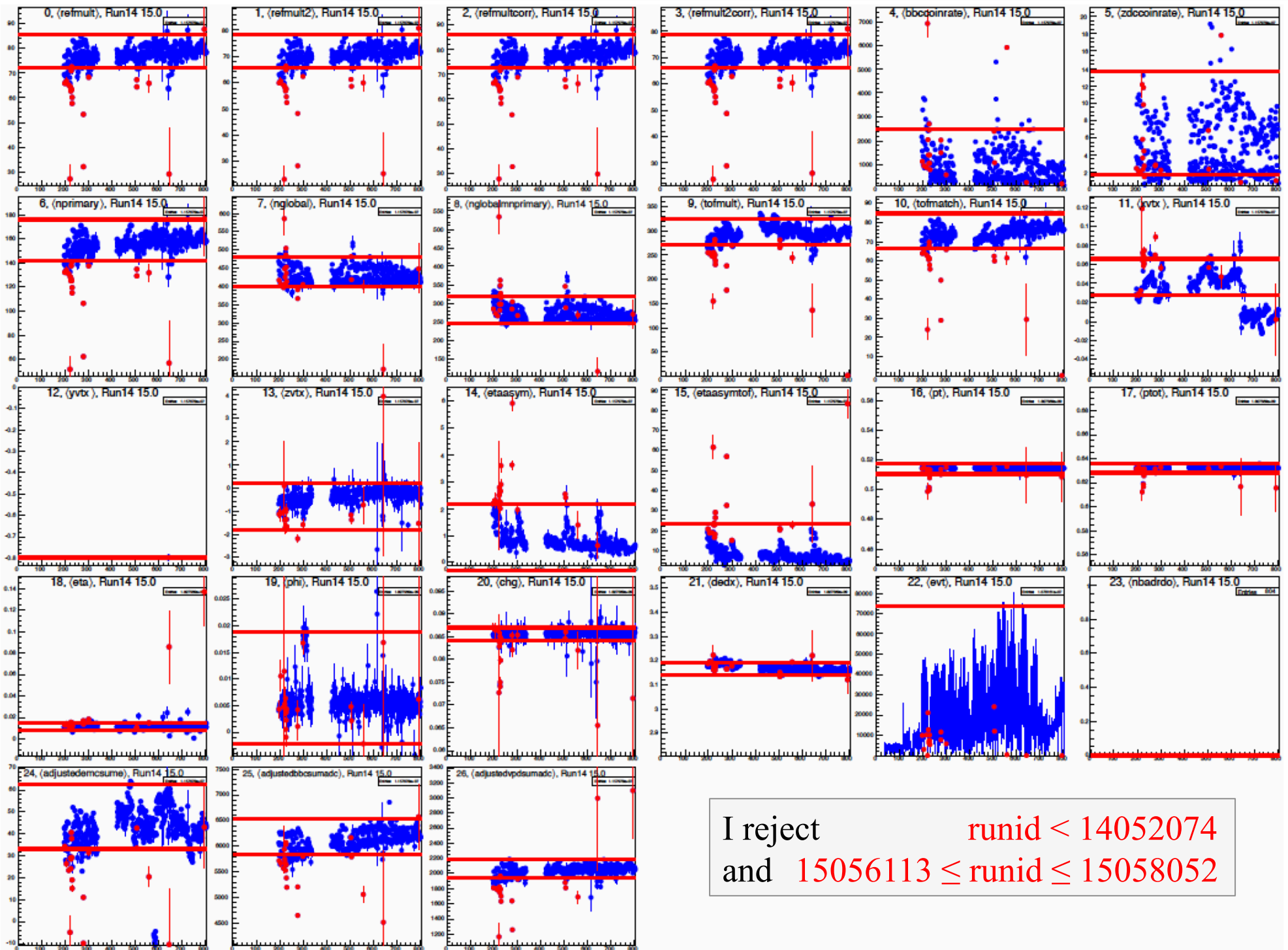
AuAu 14.6GeV run 2014 preview production is completed. Runnumbers without PXL, IST & SST detectors in have been processed. Total statistics is 405M events which includes next stream data:

st_physics - 332M events;
 st_mtd - 9.5M events;
 st_hltgood - 63.5M events;

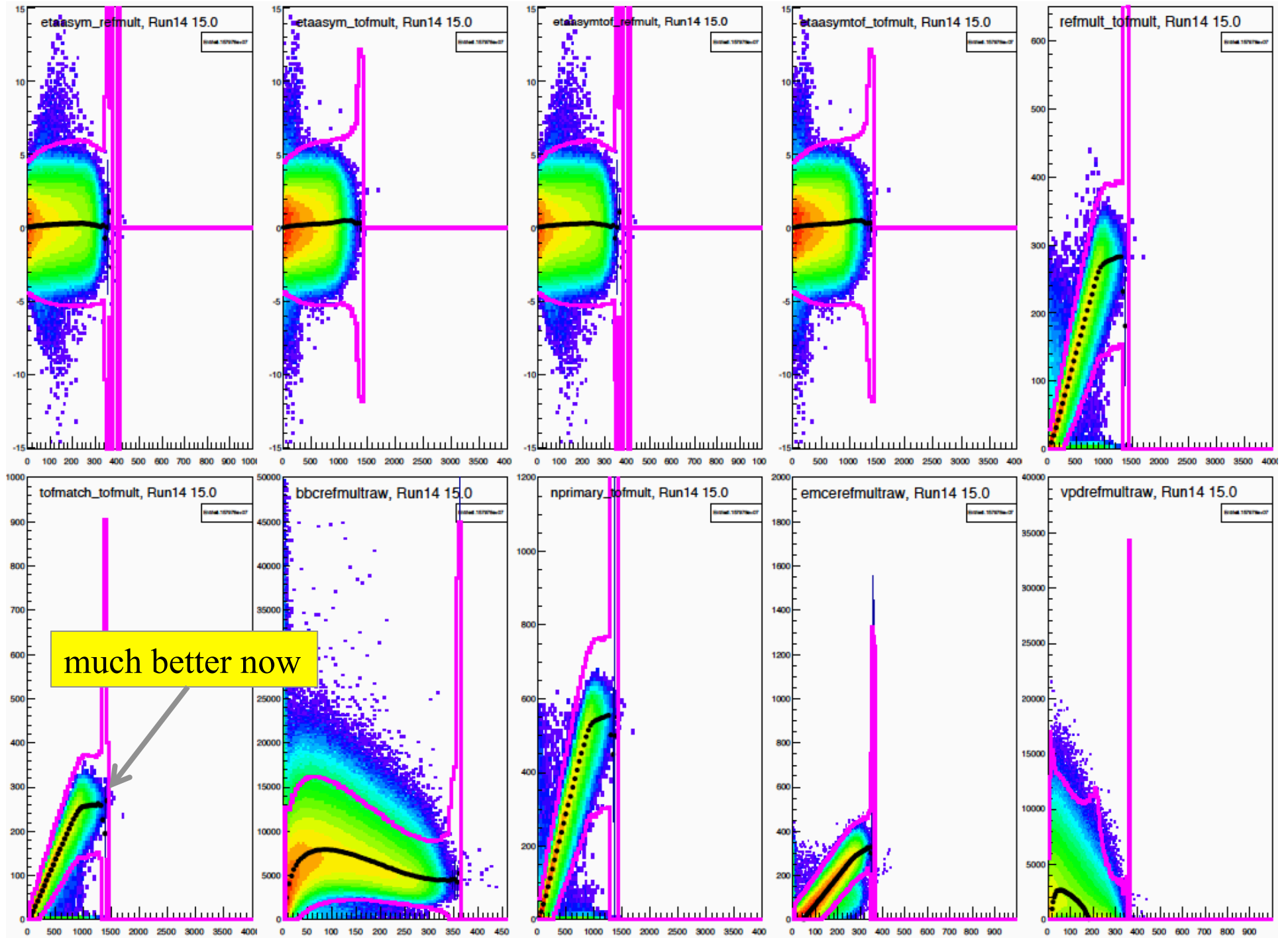
Lidia.

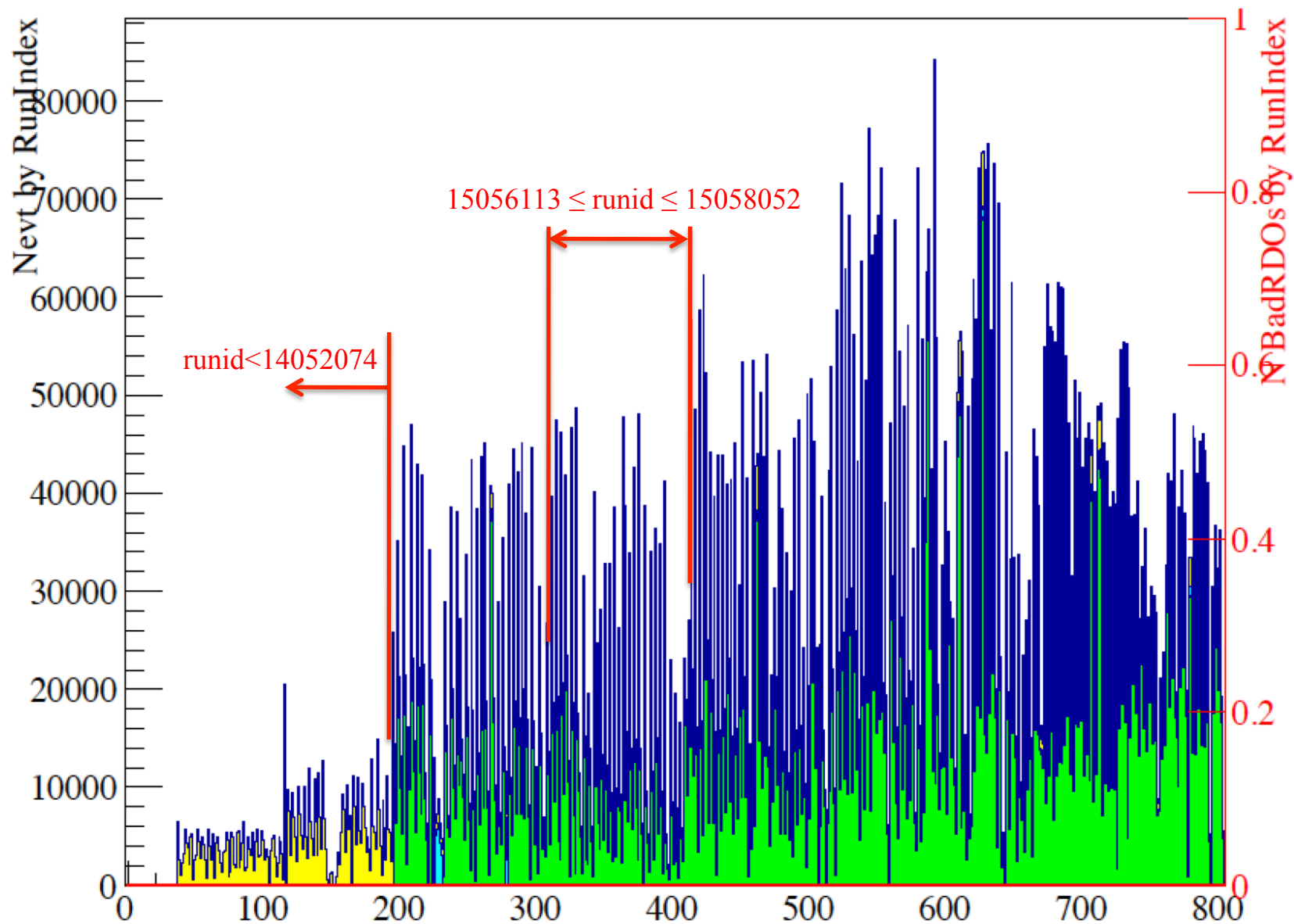


Updated versions on next page

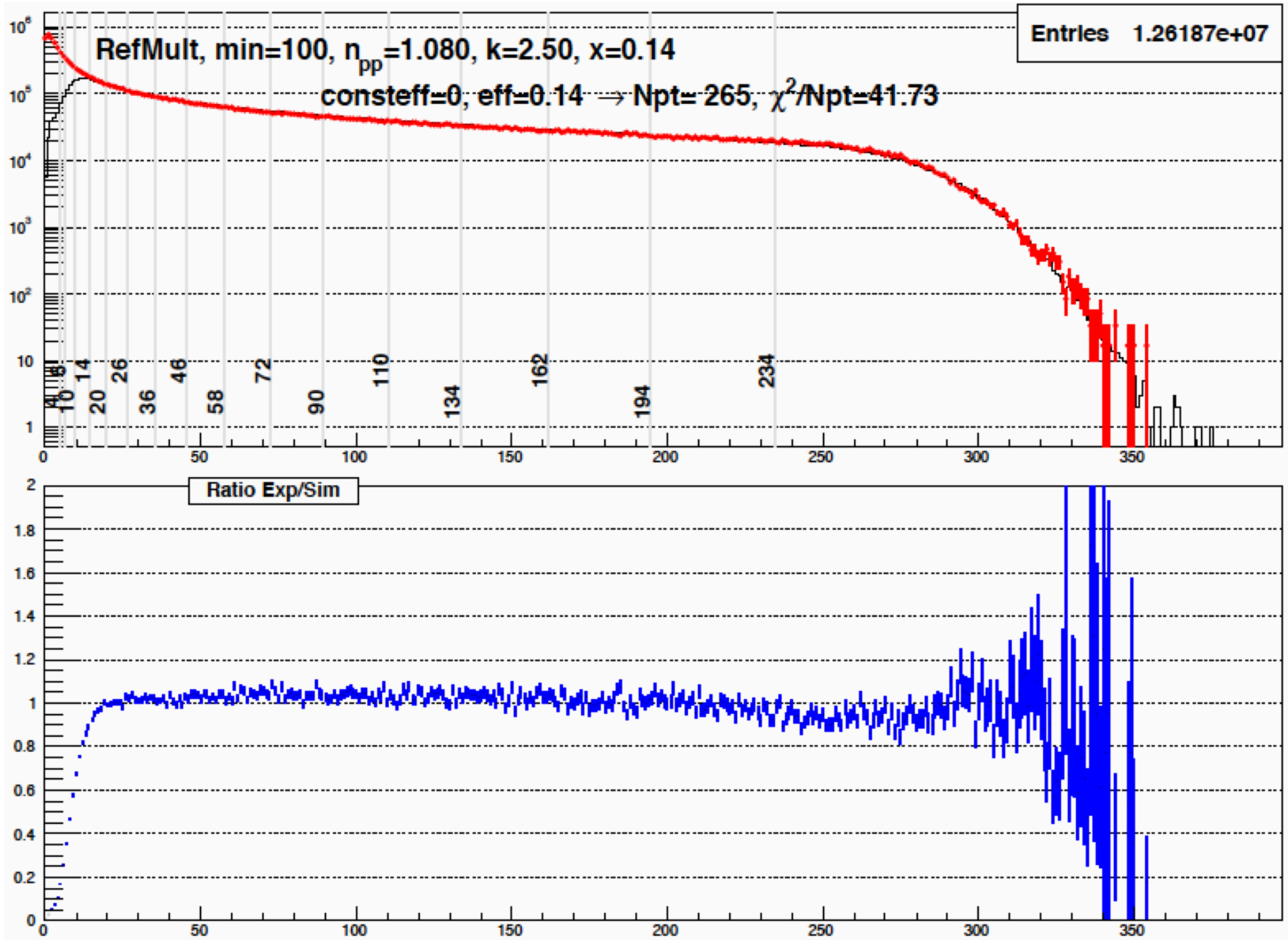


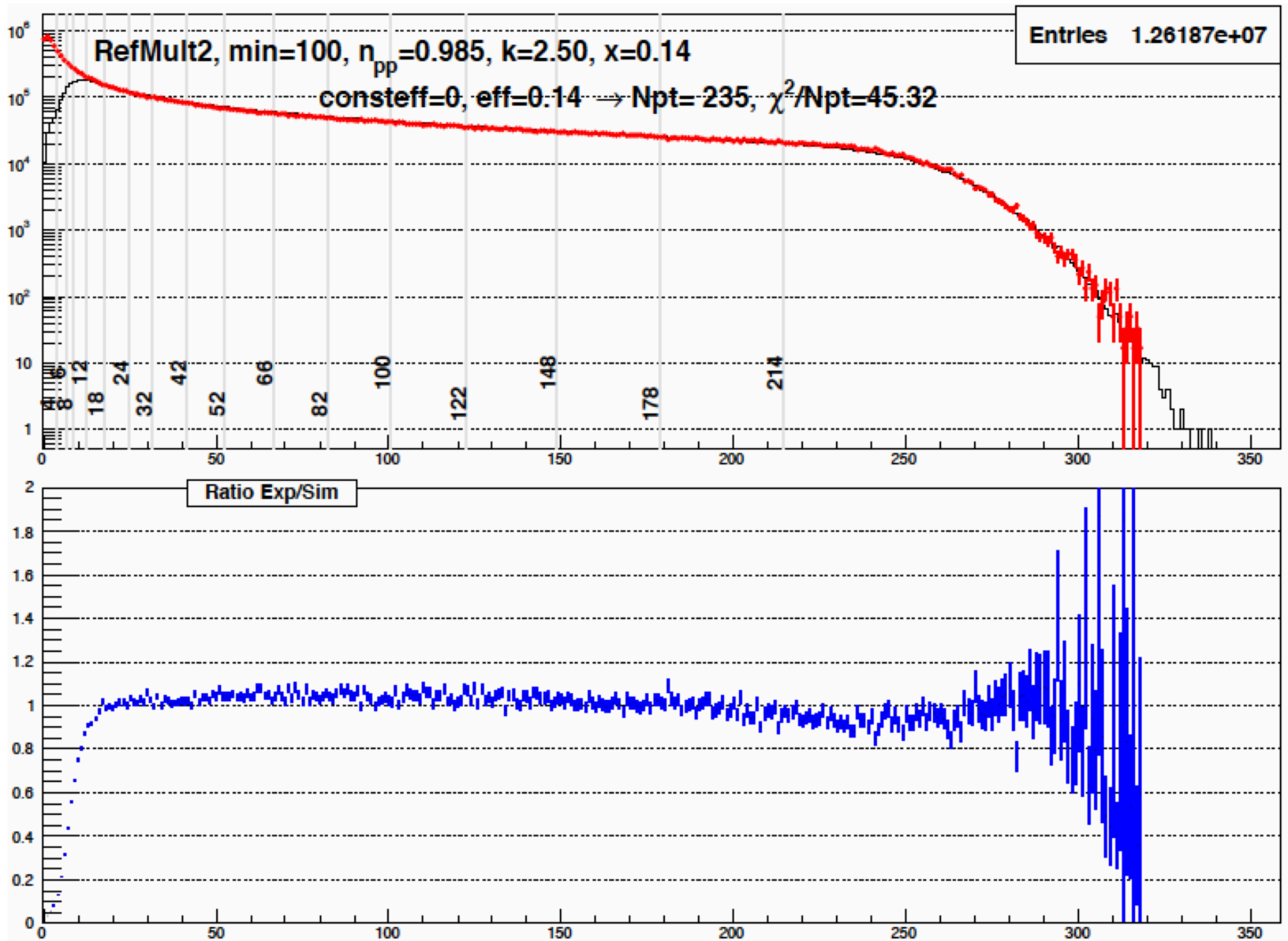
I reject $\text{runid} < 14052074$
 and $15056113 \leq \text{runid} \leq 15058052$

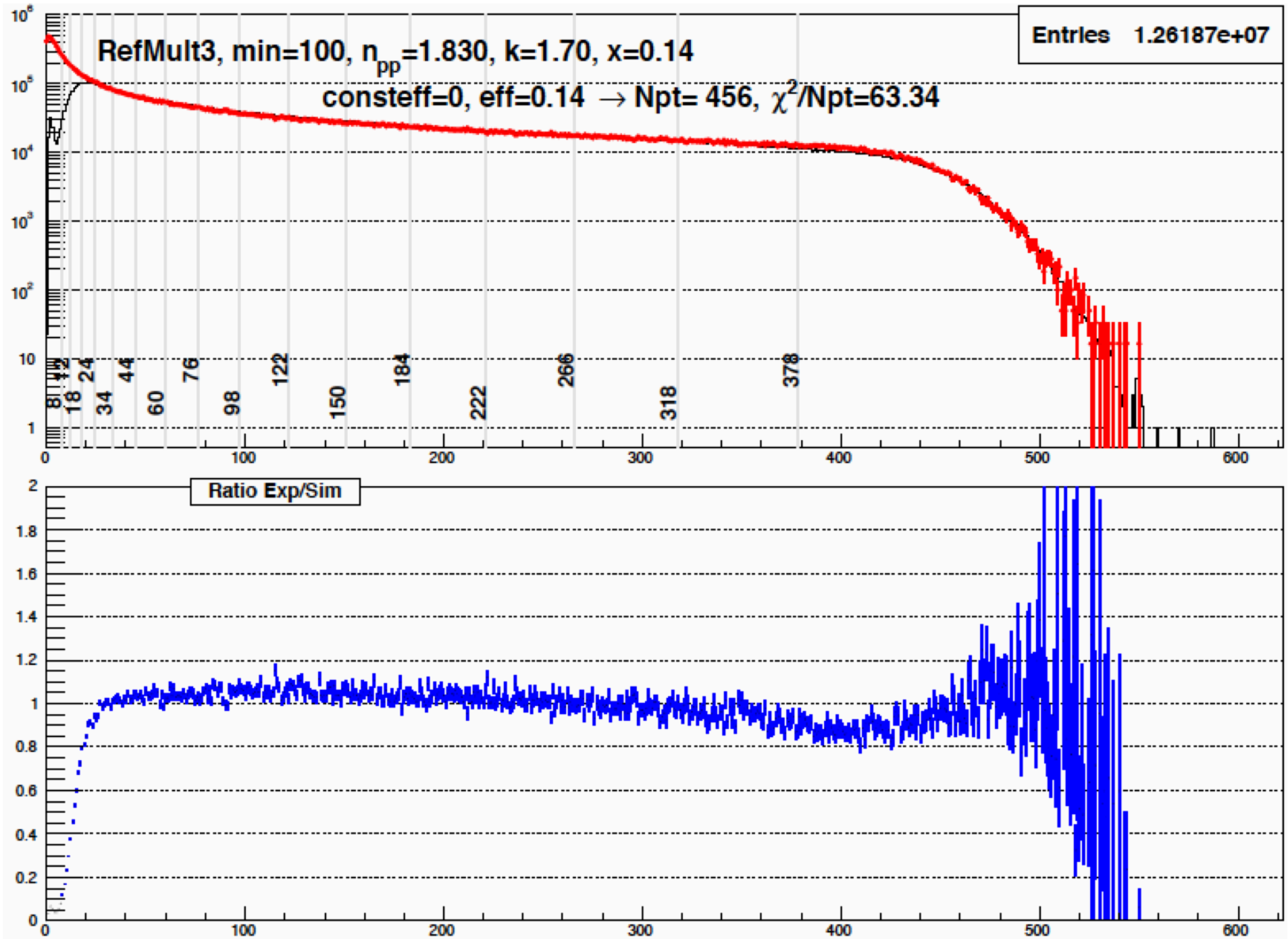


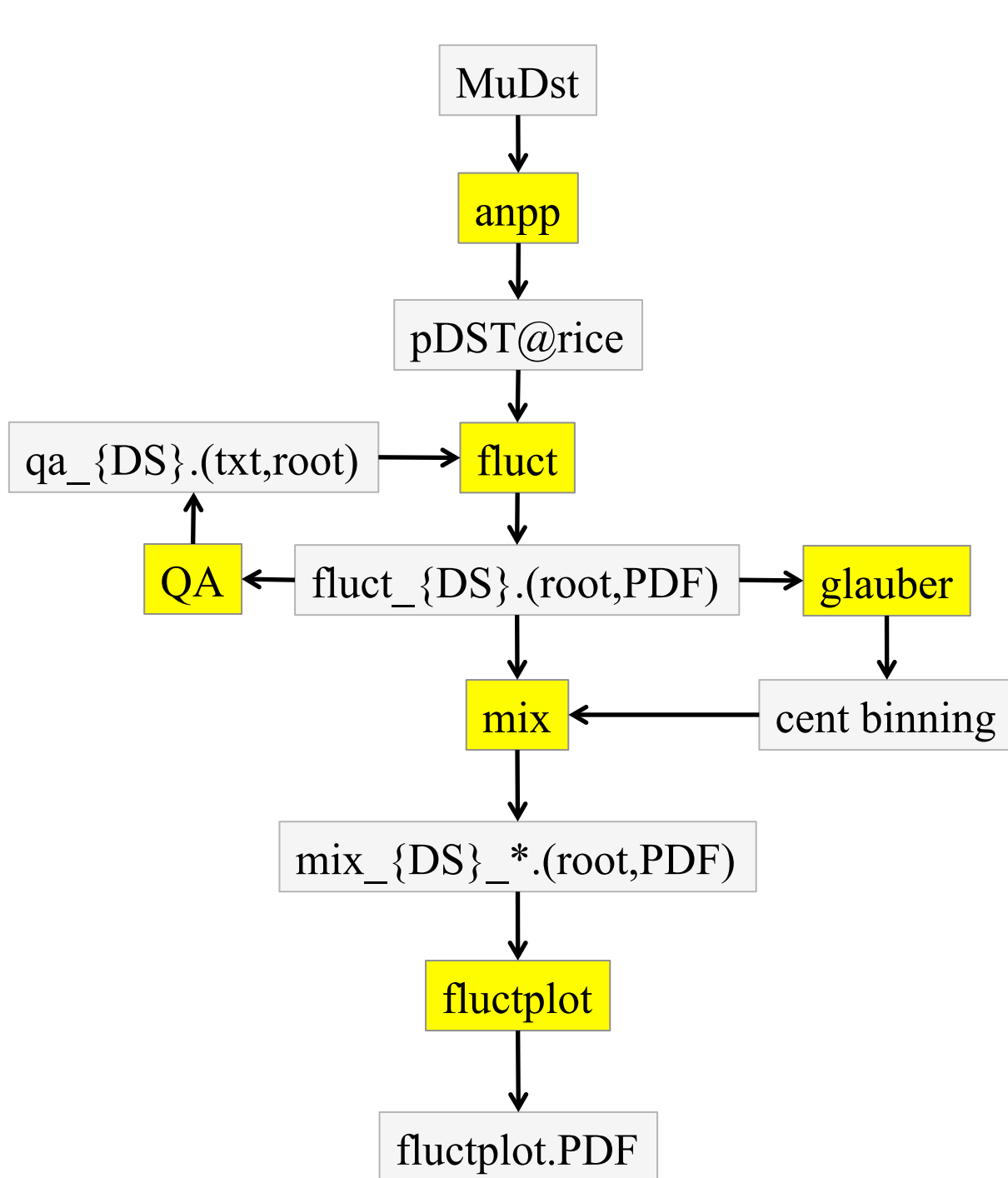


Rvtx < 1cm w.r.t. (0.0,-0.9), $|Z_{\text{vtx}}| < 30\text{cm}$, and non-test-ID BBC_mb..... **15.4 M events**
 Following preliminary Run and Event QA..... **11.5 M events**









{DS} unique identifier for year and $\sqrt{s_{NN}}$

□ Data

■ Compiled C++ code

anpp:

select minbias trigger, apply $|Zvtx|$ cut. calculate reffmultX
save event info and all primary tracks to TTrees

fluct:

fill 4 “base” TH2Ds for specific track cut sets
(net,tot,pos,neg) vs. centrality variable

qa:

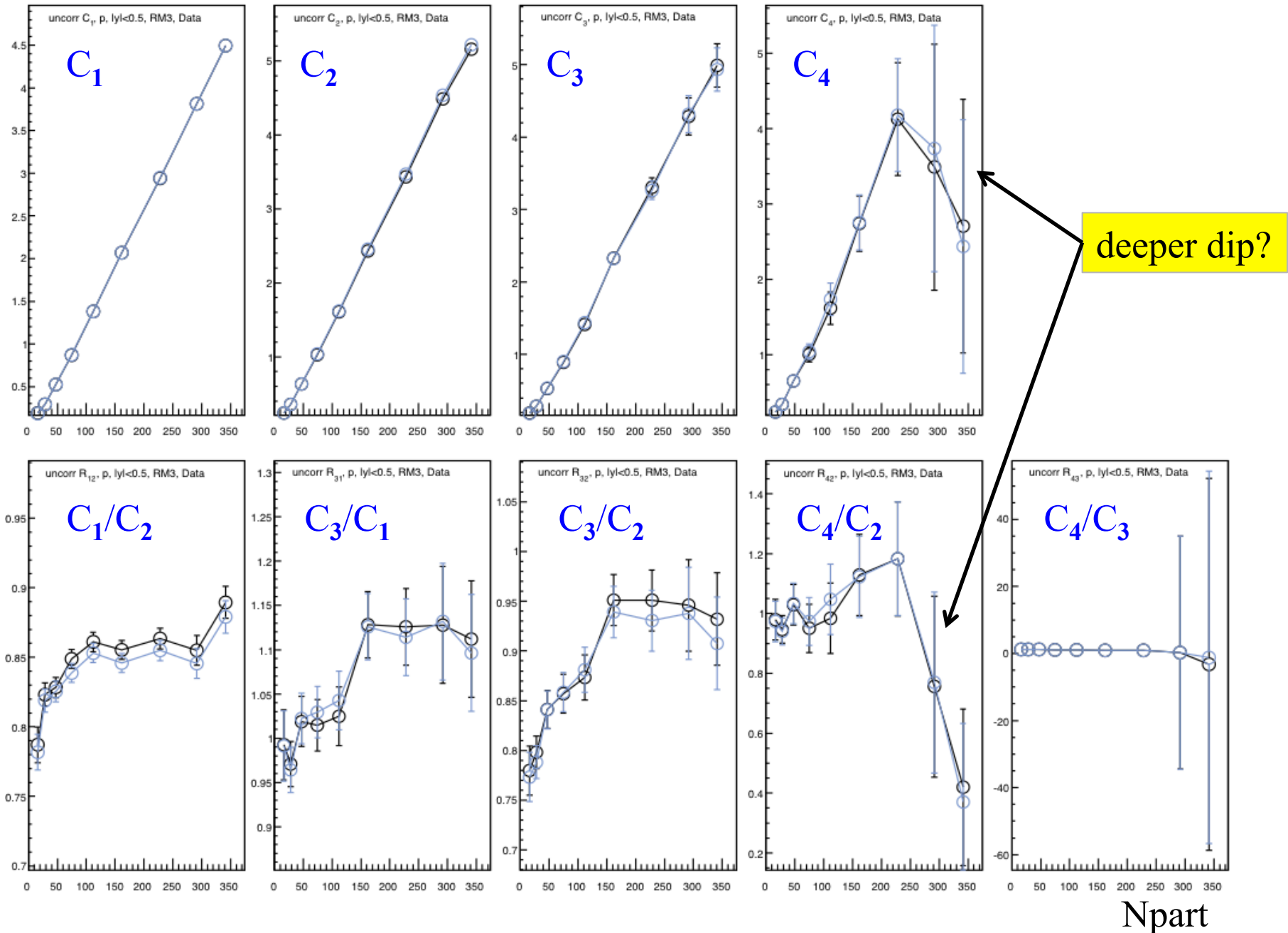
bad runs: 30 variables, check 6, require ≥ 4 vars fail
bad events: 10 2D correlation plots, check 2, $\pm N\sigma$ cuts

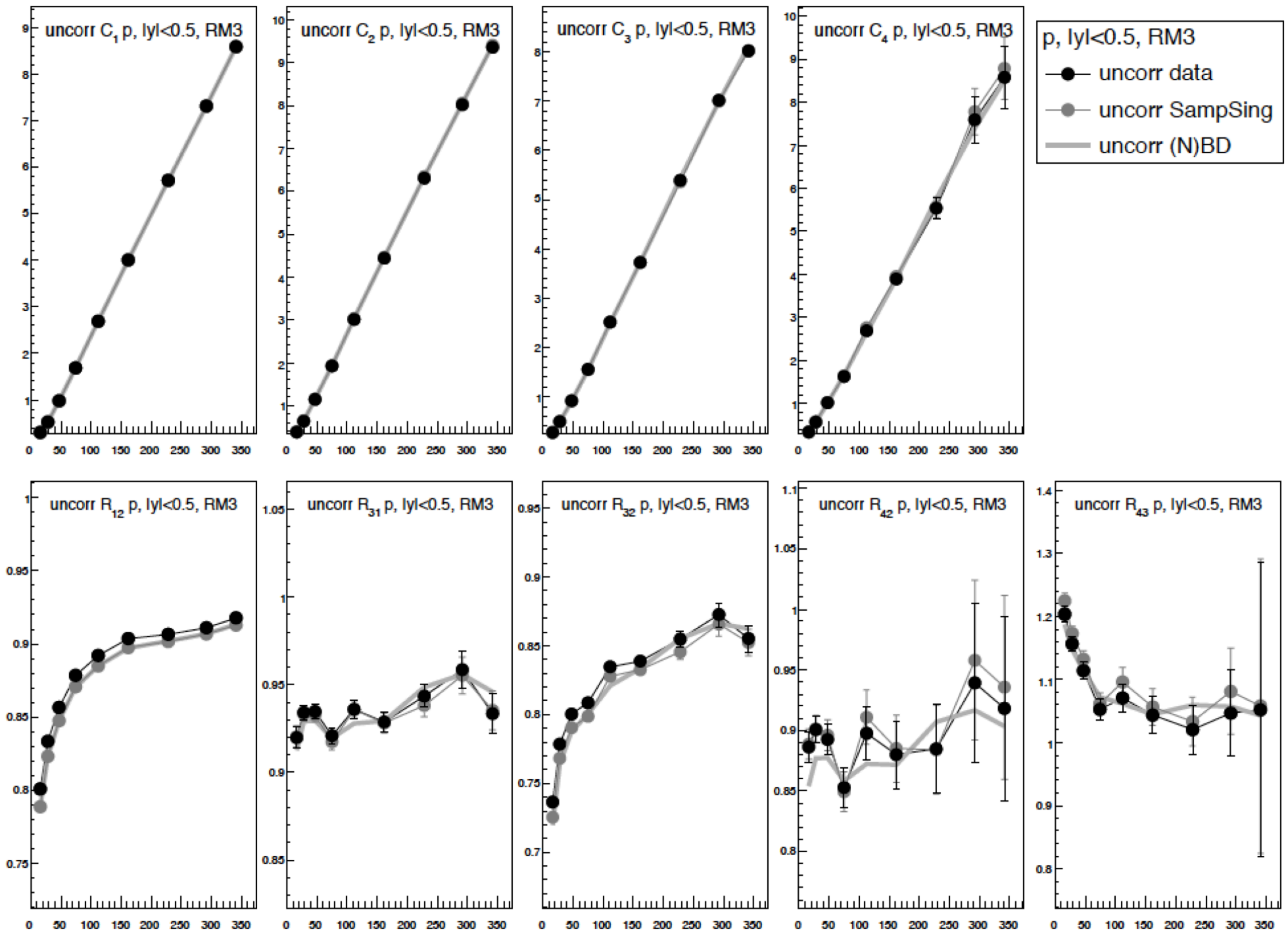
mix:

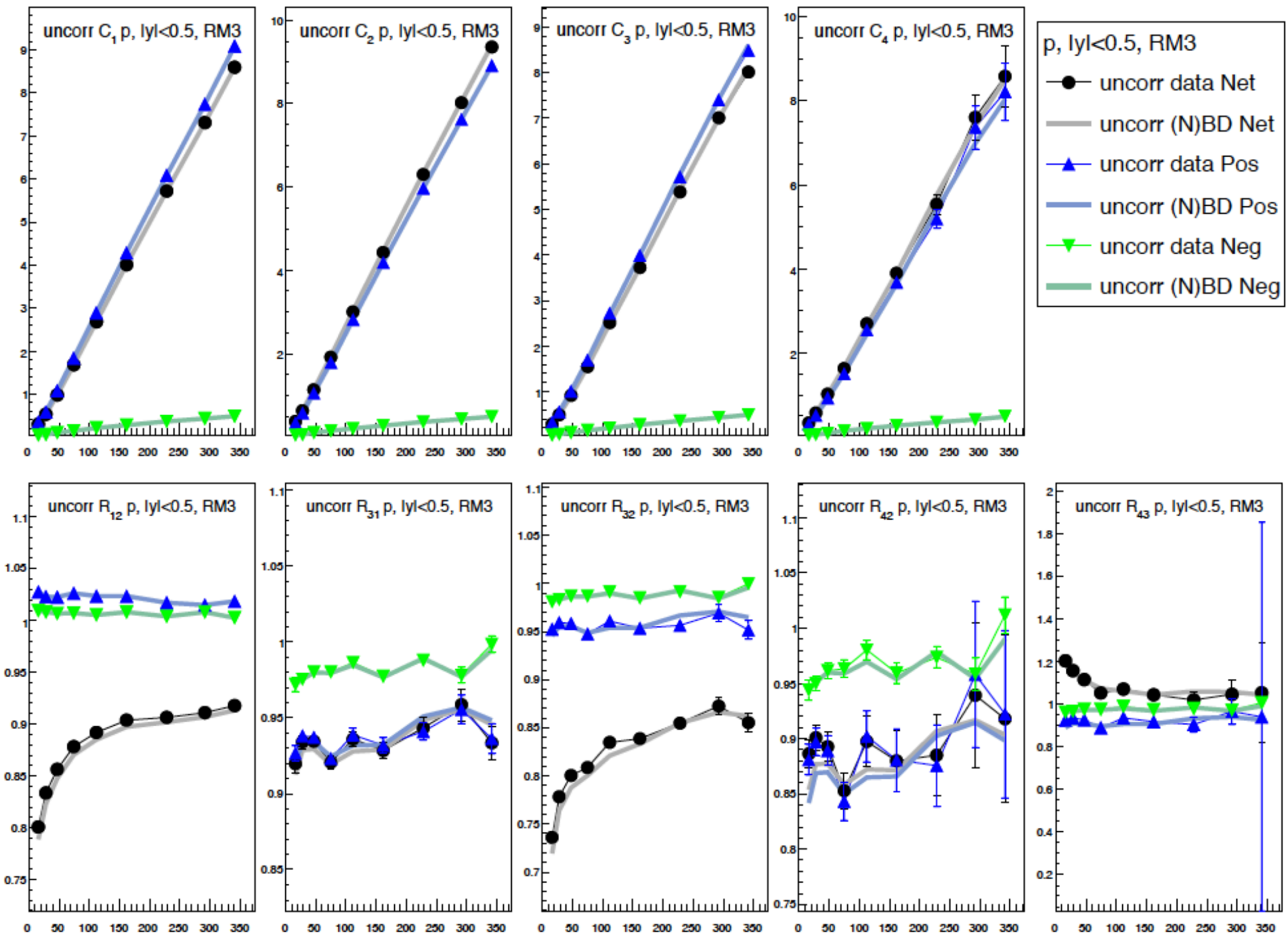
read TH2Ds from net-p paper, net-q paper, or fluct
calculate C_x , R_{xy} vs. centrality variable
efficiency corrections
CBW averaging
bootstrap errors
Sampled singles/IRV cumulant arithmetic

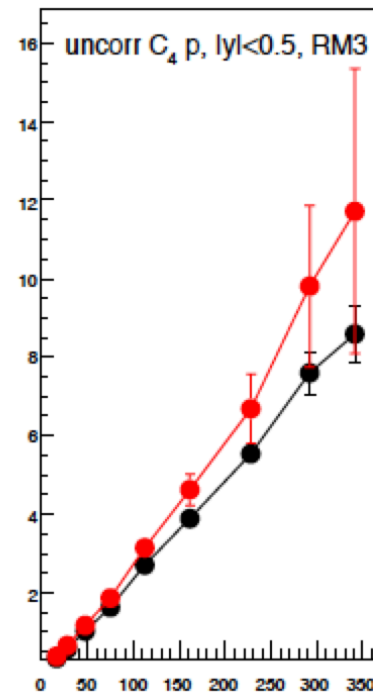
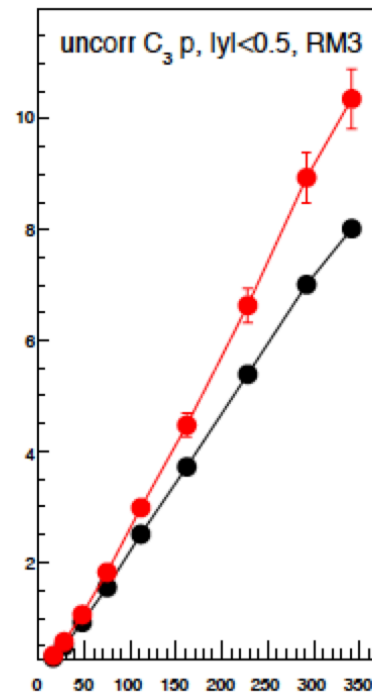
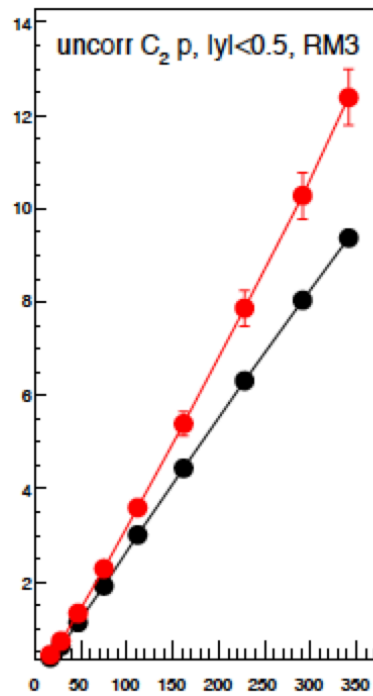
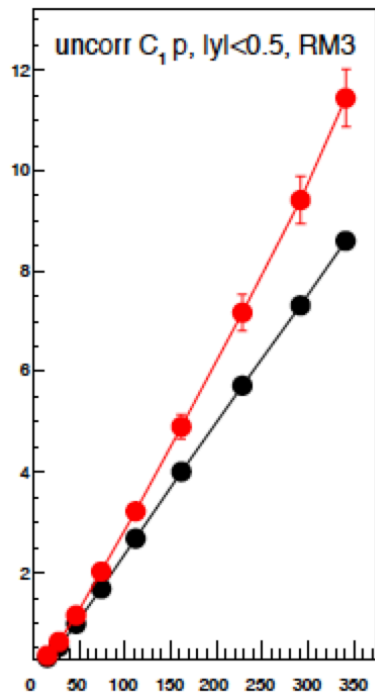
fluctplot:

collect results from all sources and make final plots
make connections to LQCD

My first results with $\sim 300k$ events... N_{part}

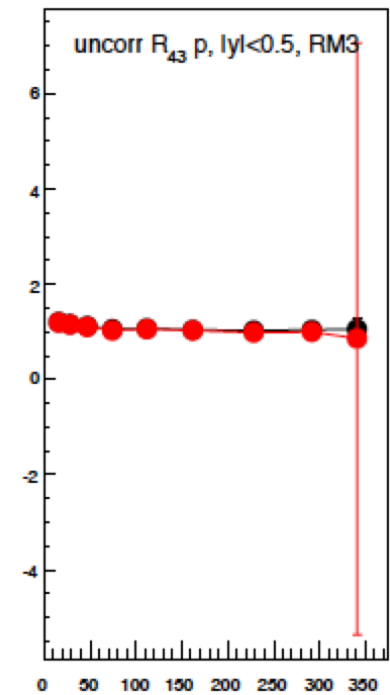
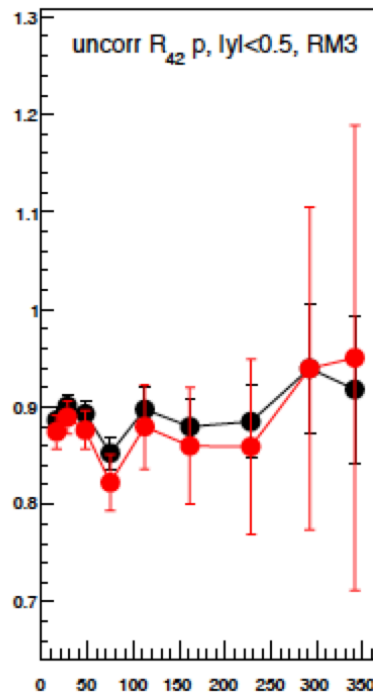
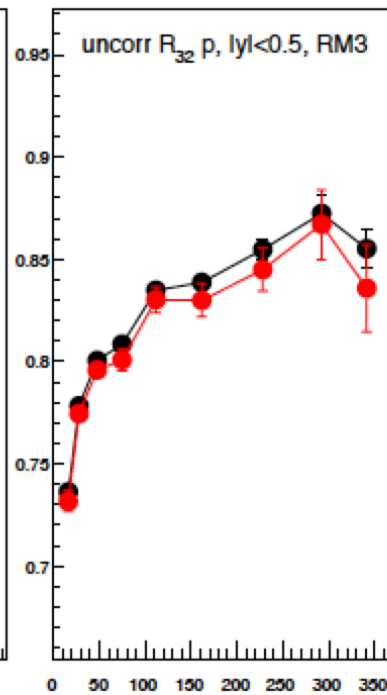
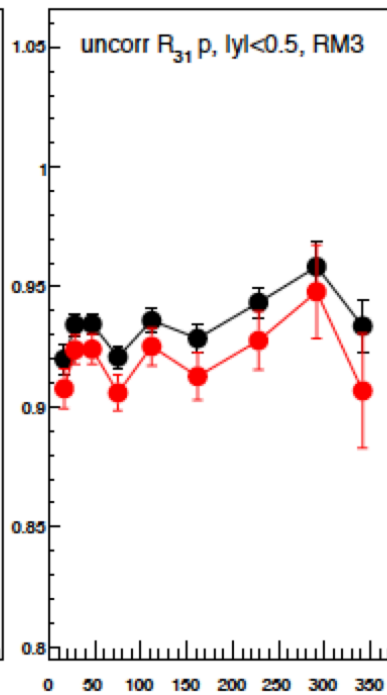
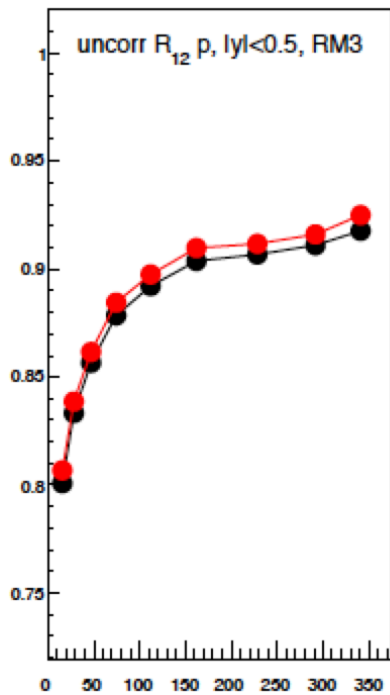


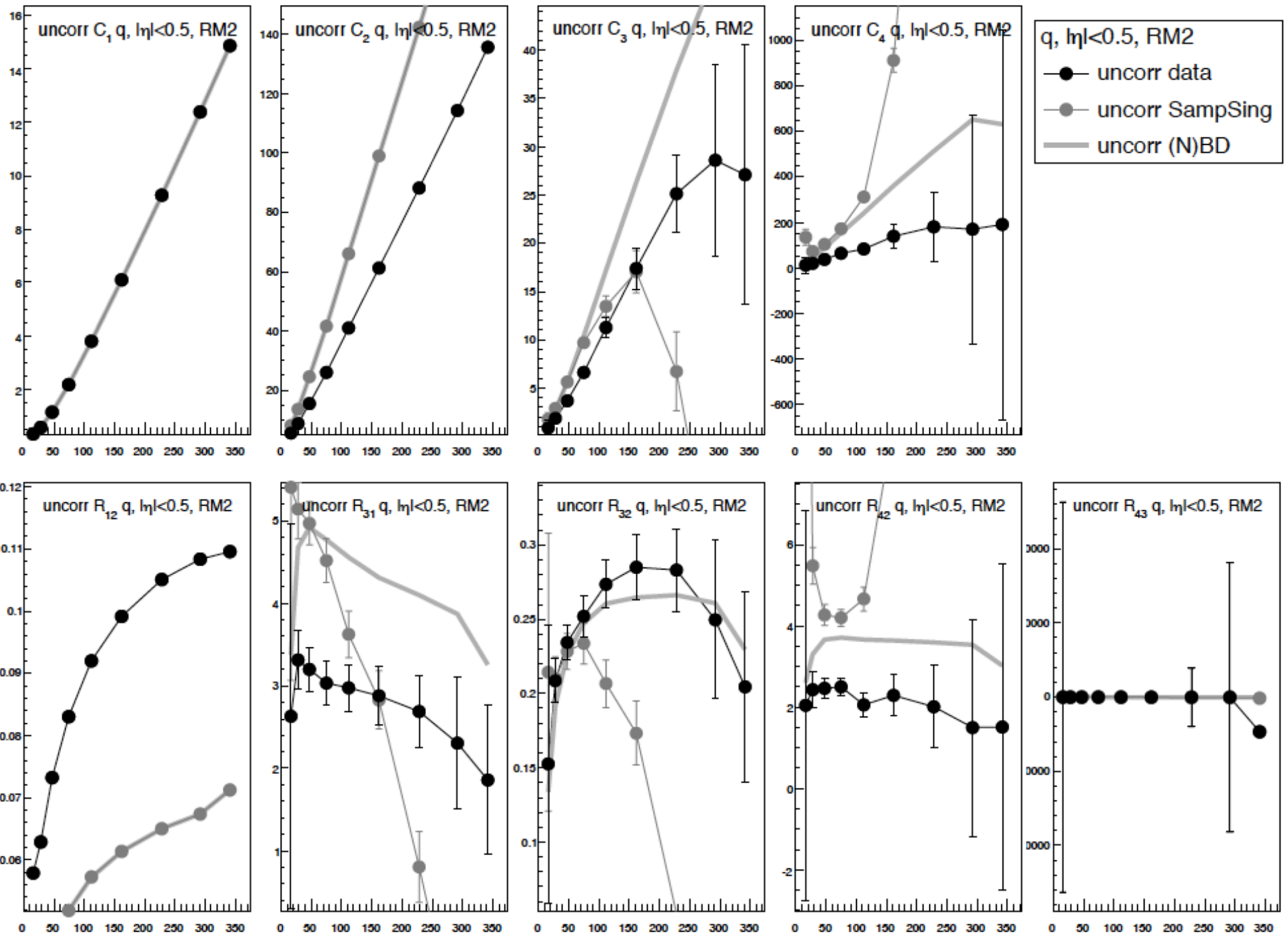


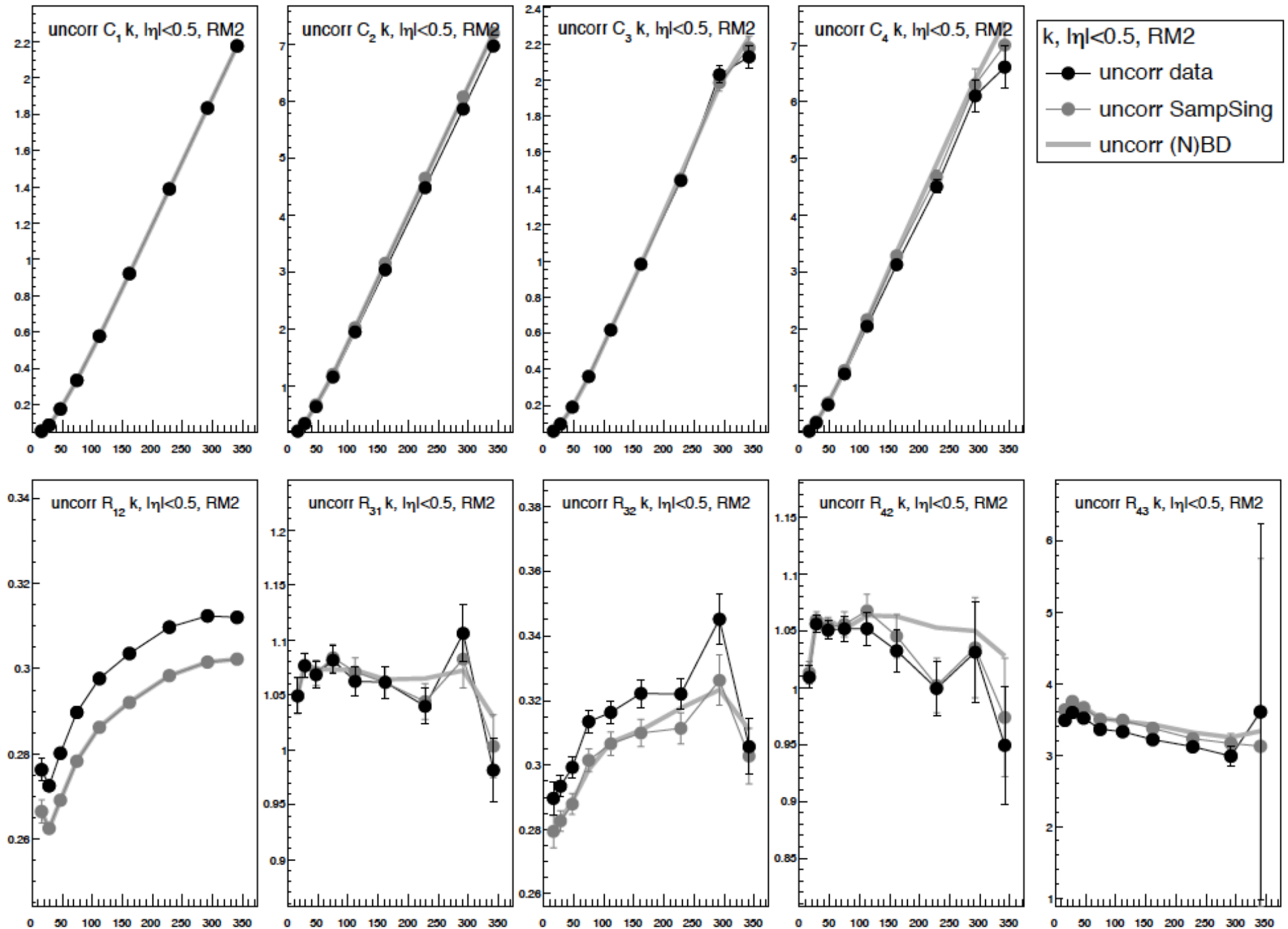
p, $|y|<0.5$, RM3

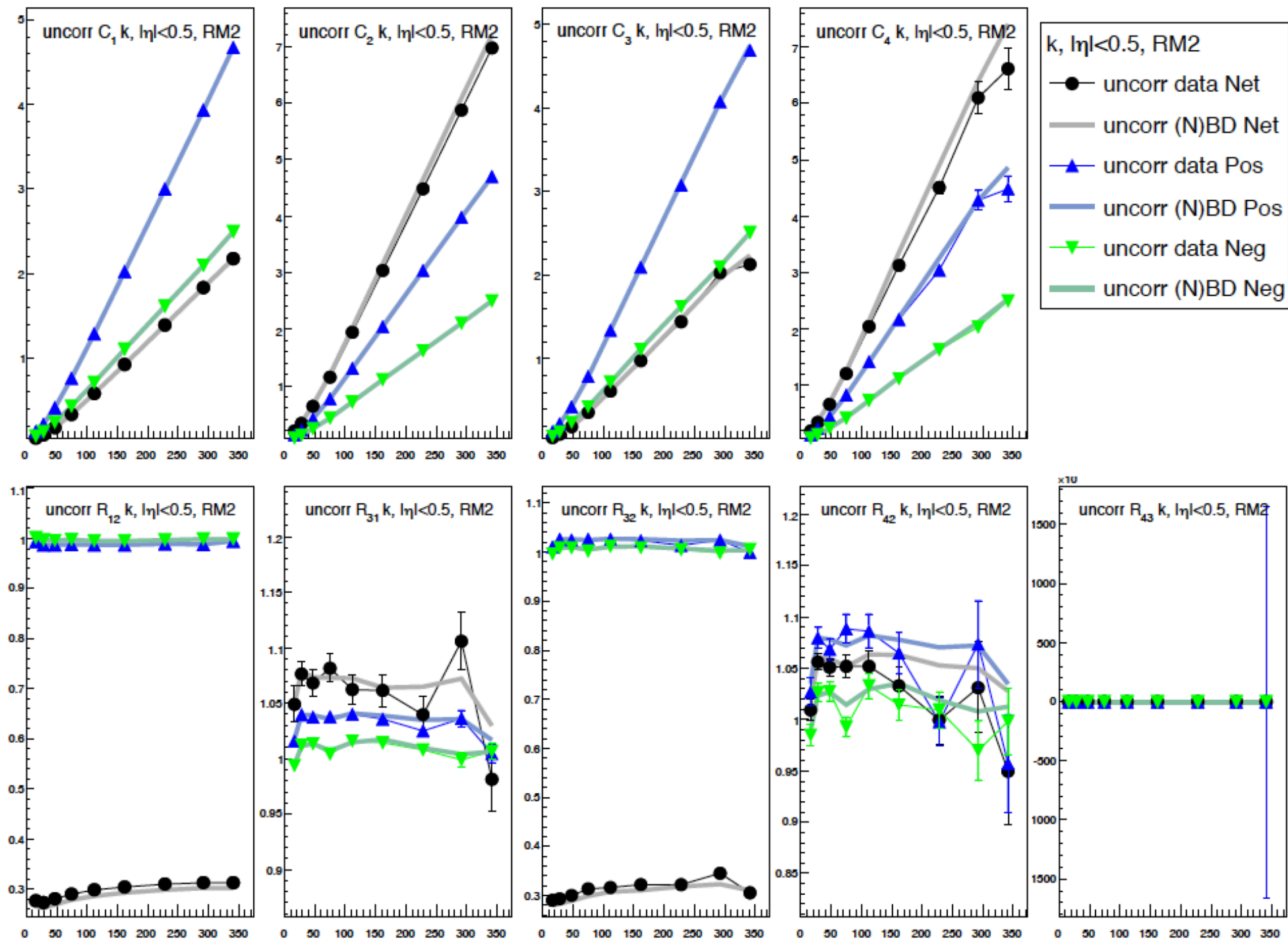
—●— uncorr data
—●— corr data

uses efficiencies
from net-p 19.6



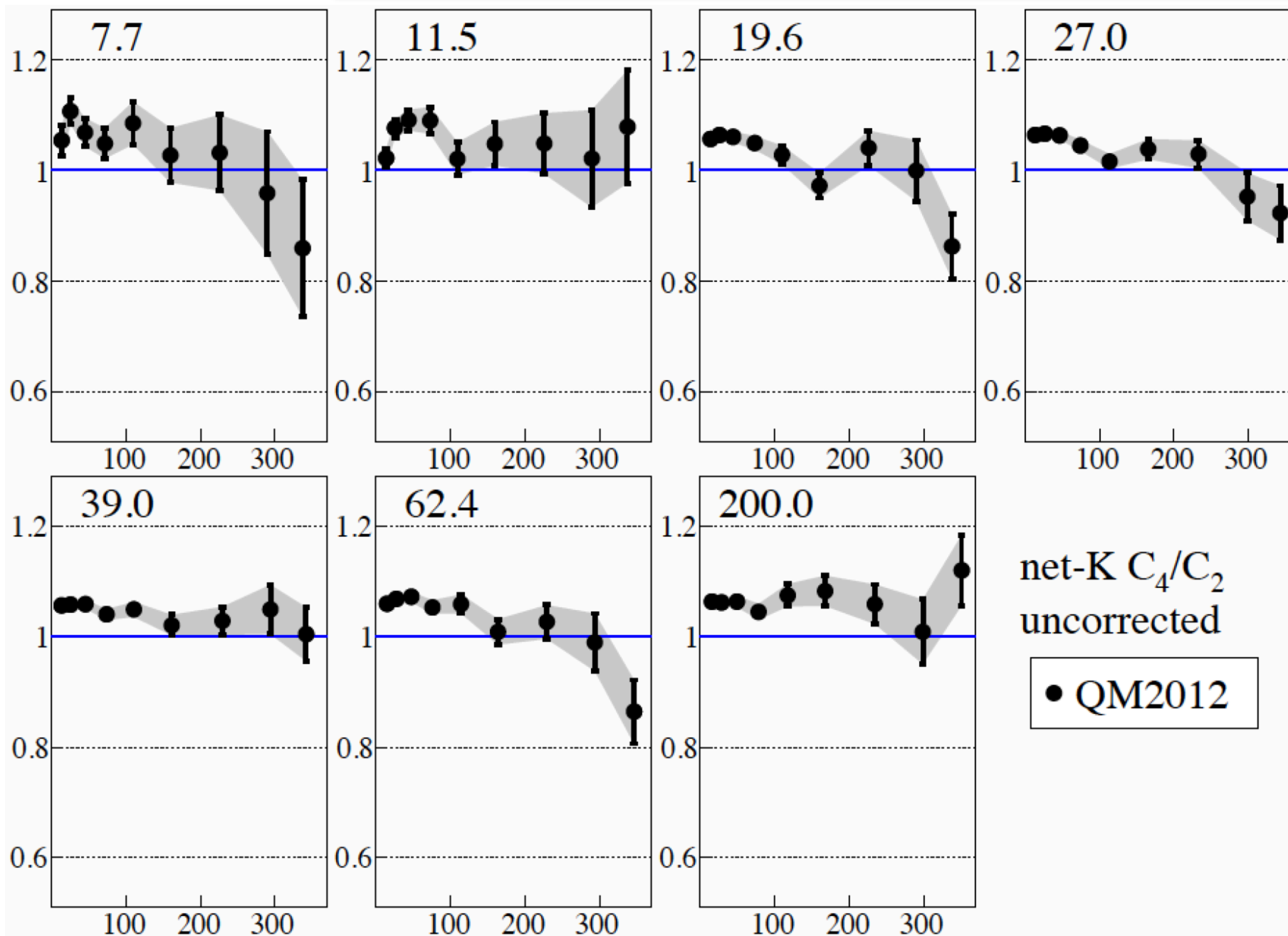




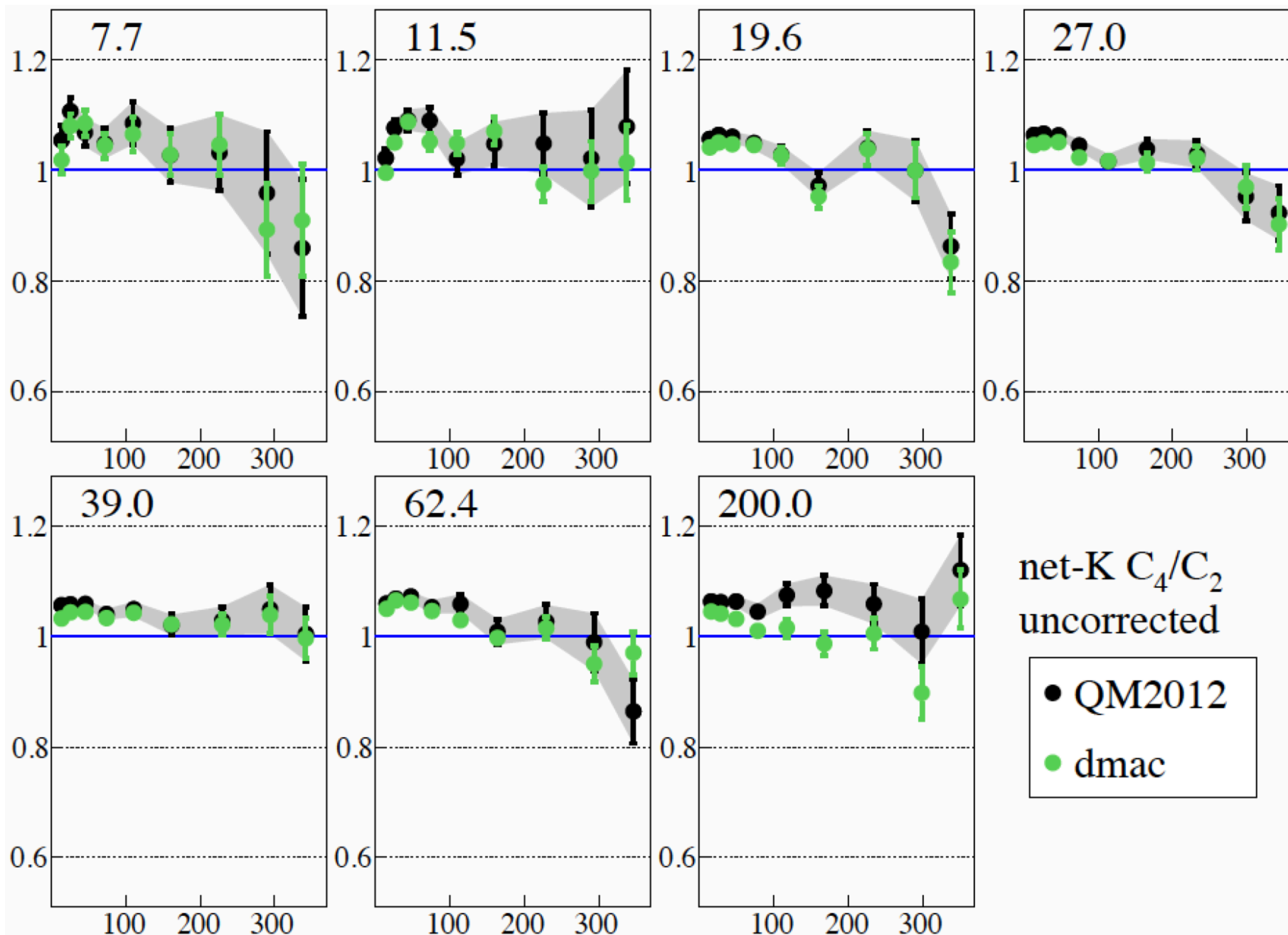


NET-K

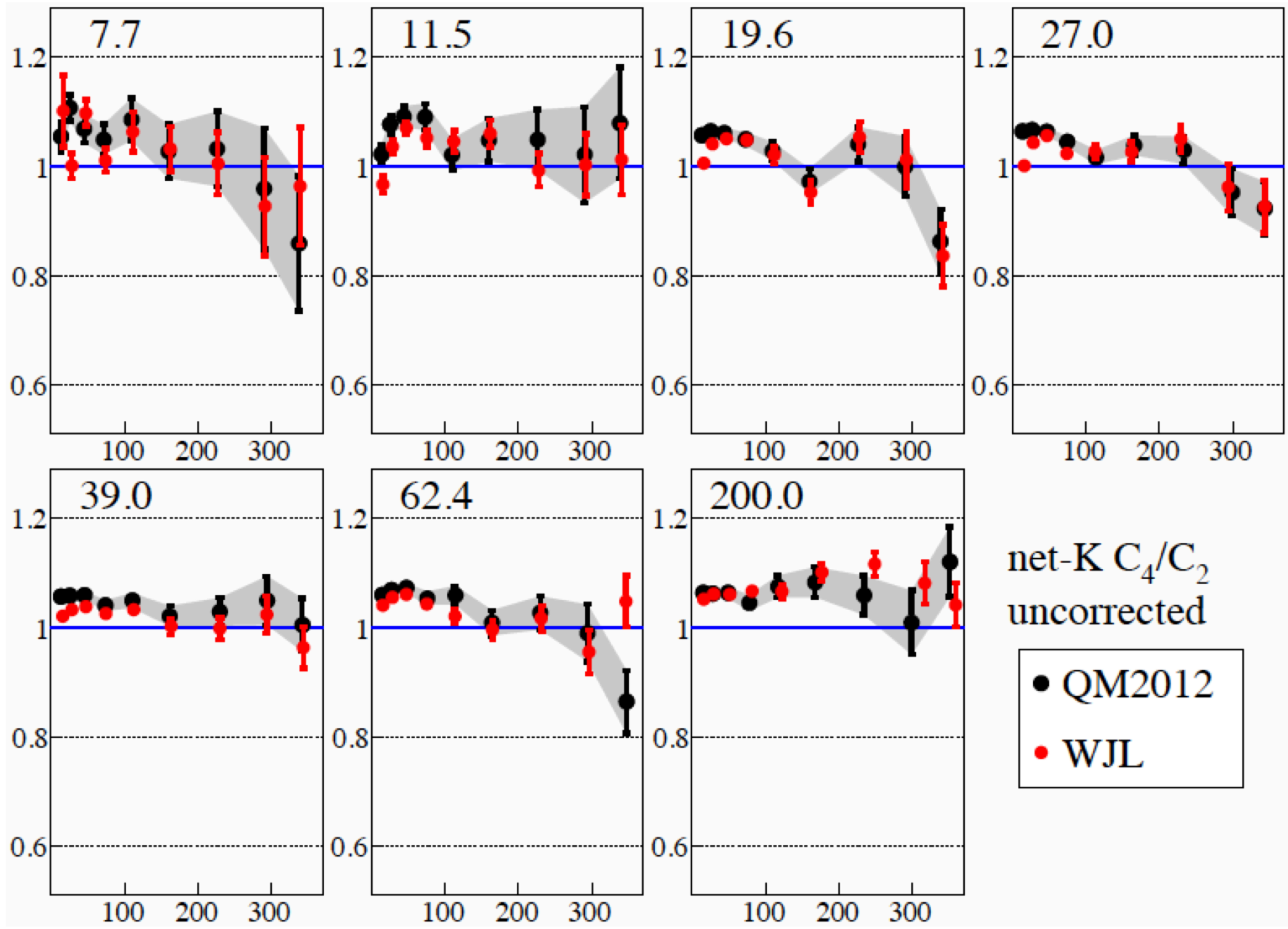
showing only 2010&2011 data from here on...



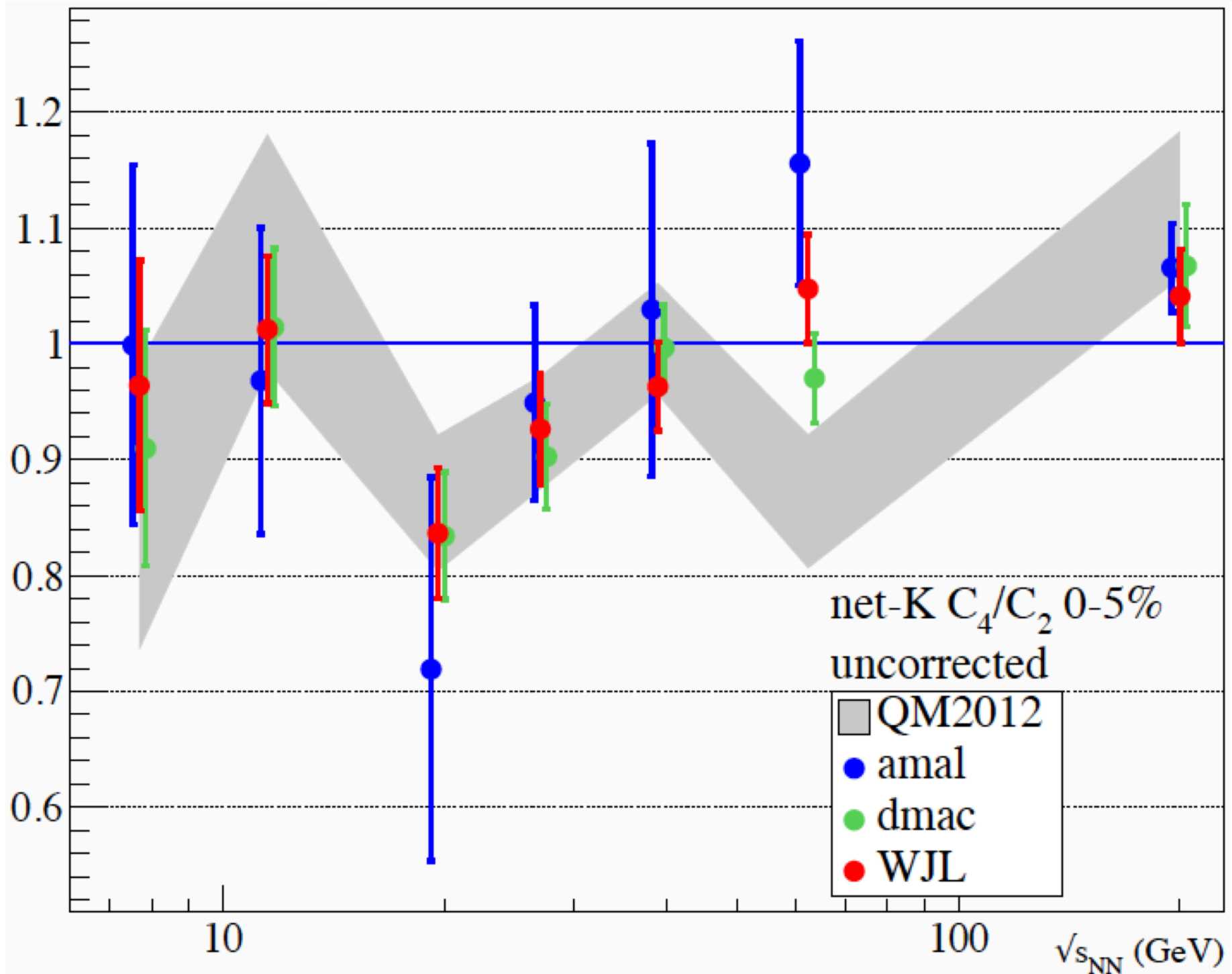
QM2012 results are the official “STAR Preliminary” and are [avg\(Gary,dmac\)](#)

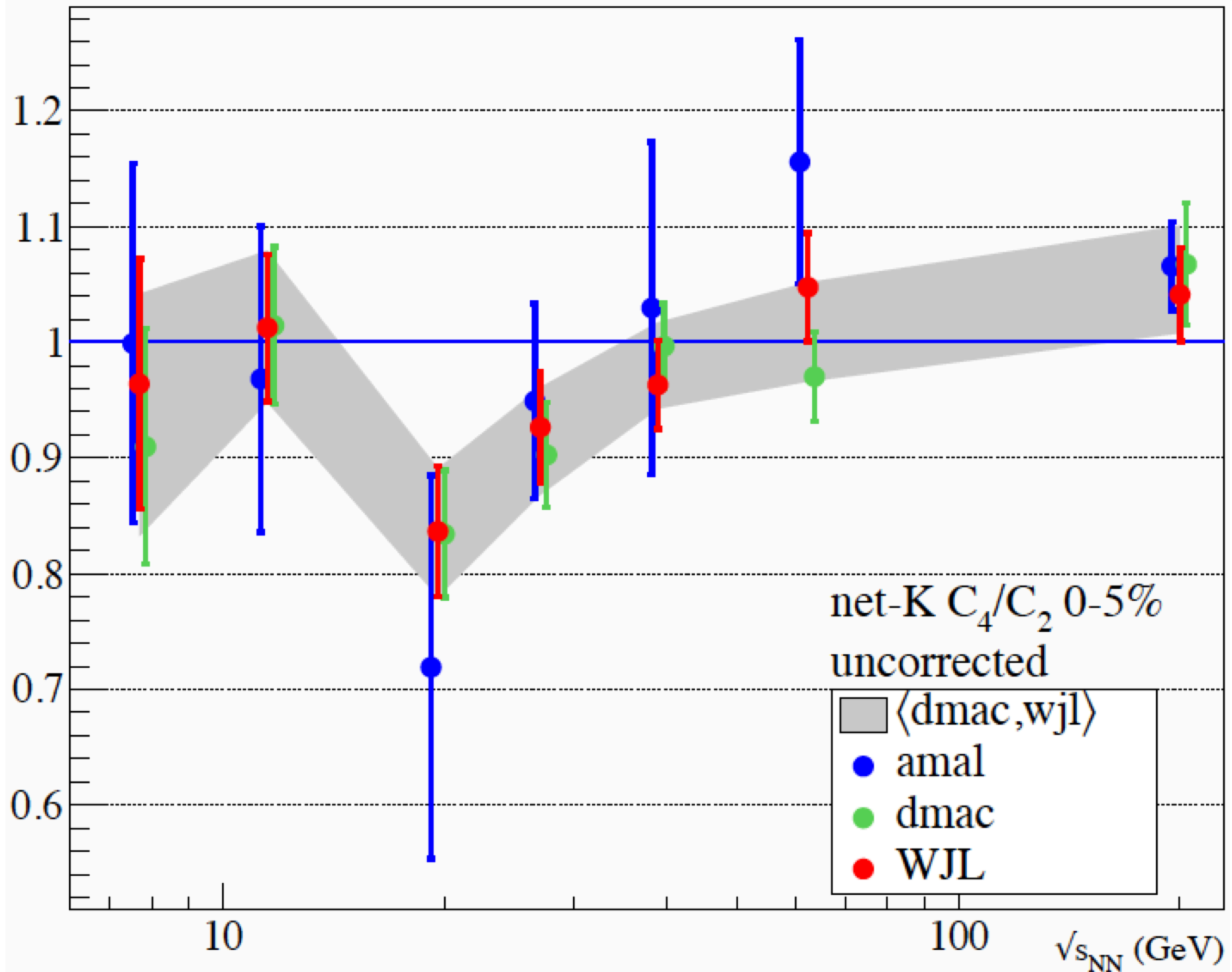


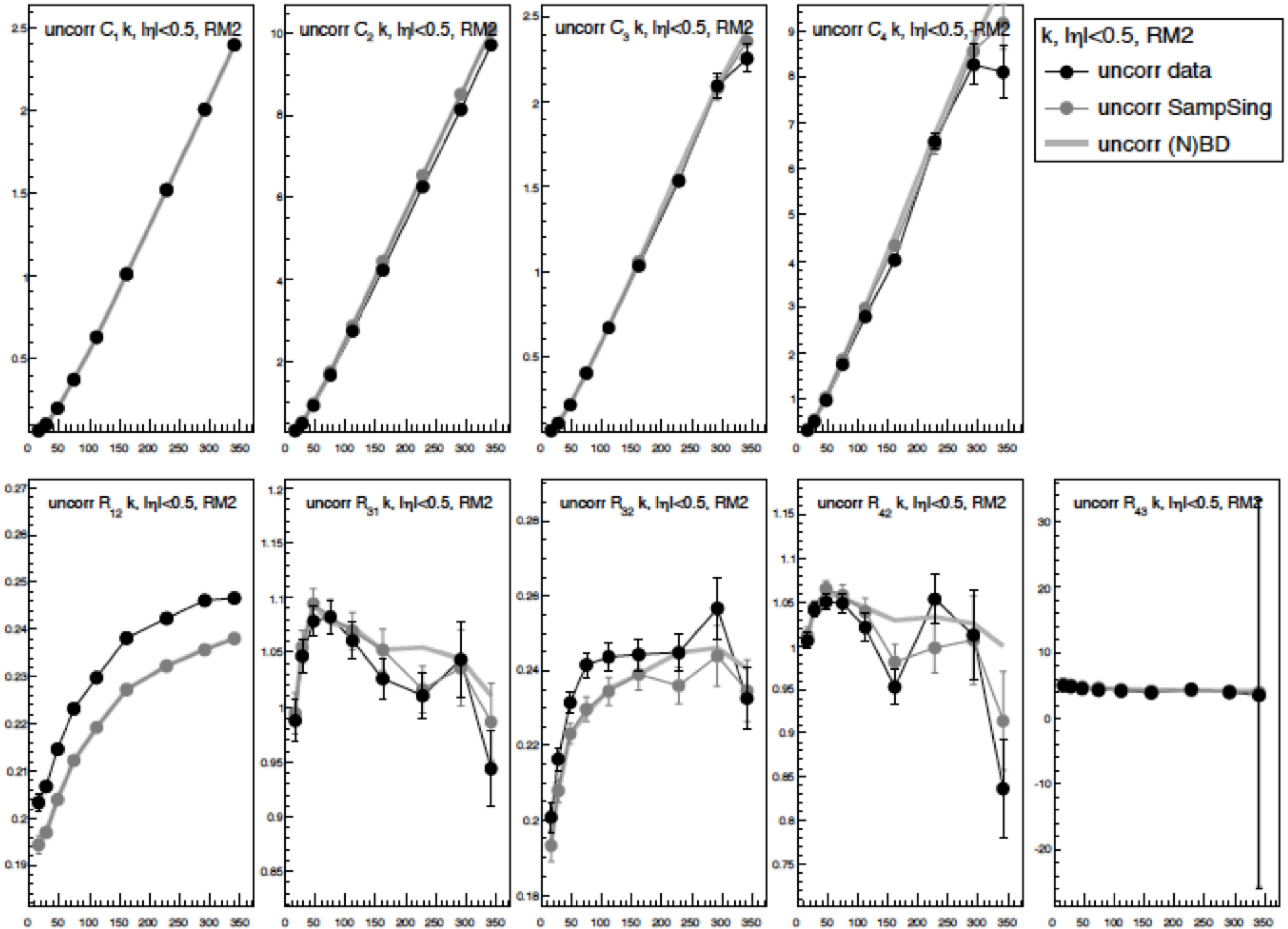
Gary and dmac results are very consistent, except 62.4 GeV 0-5% and 200 GeV

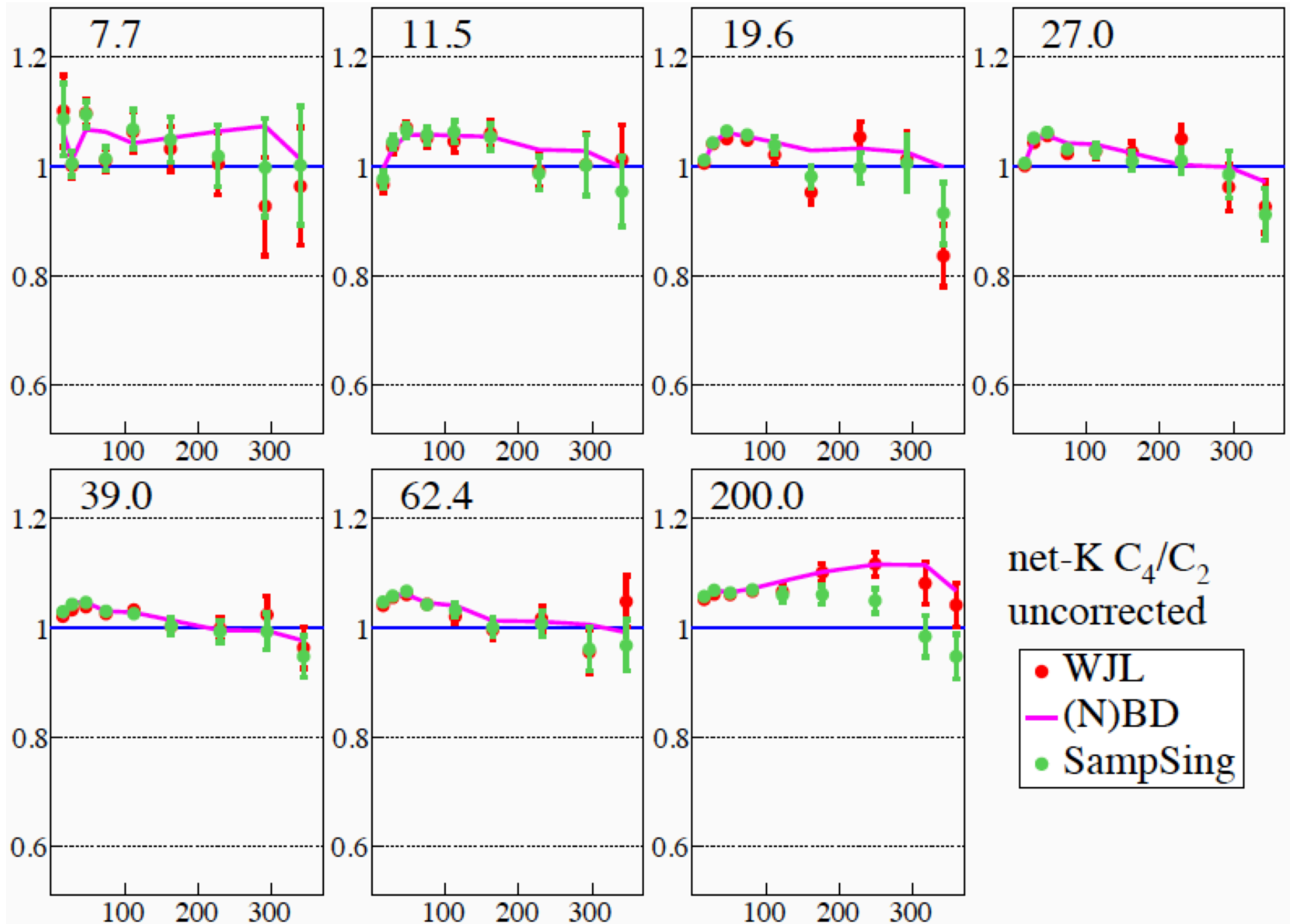


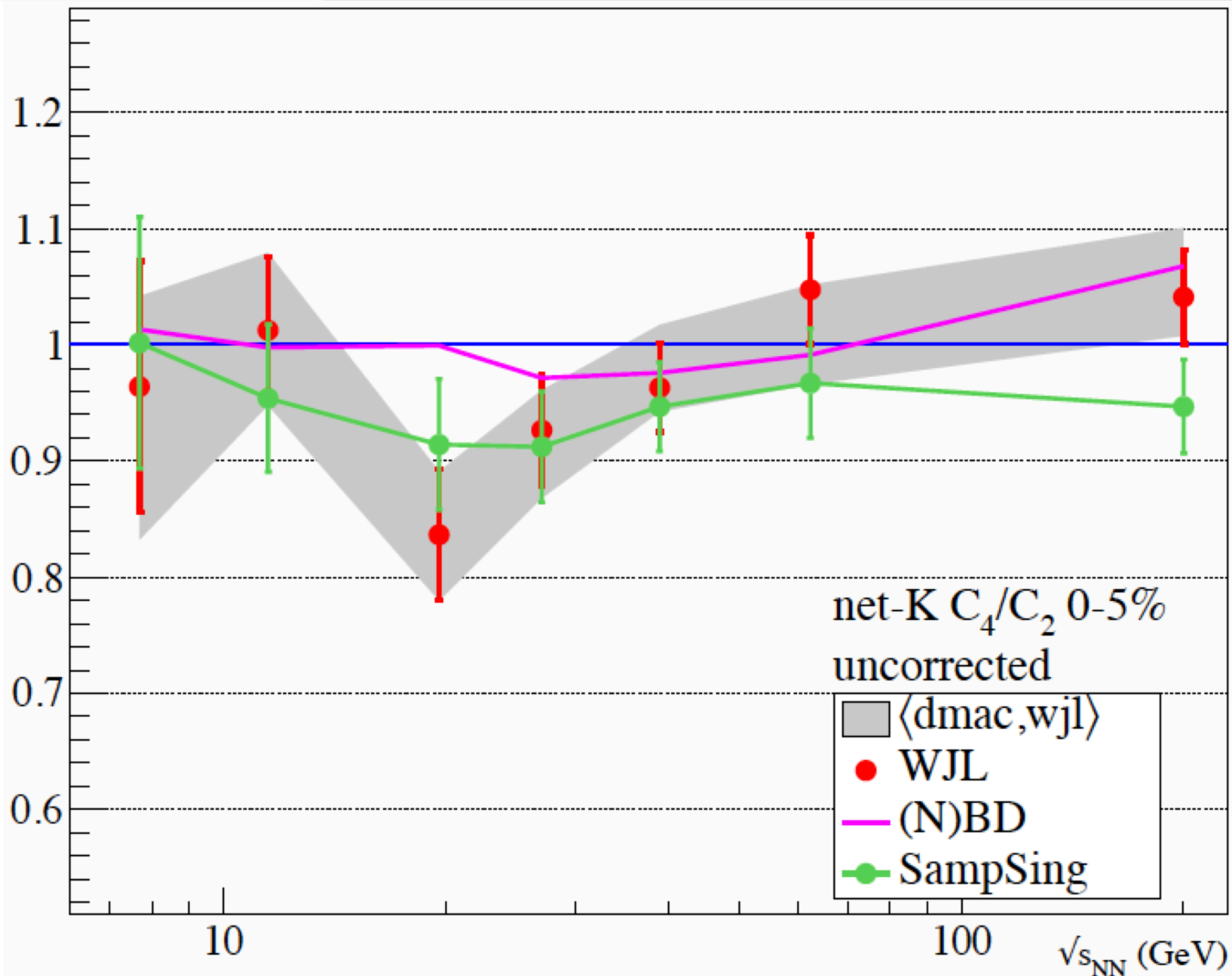
My values agree rather well with QM2012 results, I use bootstrap errors











Run-14 14.5 GeV results using almost all of the test production data.

~12M good BBC-mb events with good Rvtx and $|Z_{vtx}| < 30\text{cm}$

~11M good events with tighter restrictions on tofmult...

RefMult, RefMult2, & RefMult3 distributions generally look o.k.

uncorrected net-p $C_4/C_2 \sim 0.92$

the “dip” I saw in the initial 300kevt analysis mostly gone in present dataset

uncorrected net-K $C_4/C_2 \sim 0.98$

~~I do need to tighten up the 1DQA and 2DQA.~~ Now done.

More events at 14.5 GeV would certainly be helpful.

2010&2011 data net-K comparison plots shown for uncorrected cumulants

STAR Preliminary, dmac, plus new WJL & amal