

Update on BES light nuclei

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☆ *Collab Mtg, 2/27/2013, BNL*

physics directions: http://wjlllope.rice.edu/d/DNP2012_Llope.pdf

Tree, analysis, PID, spectra, and ratios codes all in place...

Still improving corrections....

Since QM2012

- Adding ^3He & anti- ^3He
- Five track cuts sets for systematics: none, loose, tight, cross-terms
- Detailed event QA (*a la* bulkcorr)
- Feiddown – added more events, centrality dependence
- TOF match eff – improving systematic treatment
- Extend/Simplify implementation of corrections in analysis code

- embedding 56(64) particle/root-s groups needed, 18 available (was 7!)
 - no longer using SL10h_emb sets (Lokesh's p&pbar 7.7,11.5,39)
 - refmult scaling, now with better centrality binning
 - Absorption scaling
 - Run-11 vs. Run-10
- Additional systematic tests of absorption correction

	p	pbar	d	dbar	t	tbar	h	hbar
7.7 (r10)								
11.5 (r10)								
19.6 (r11)	2012305 SL11d_emb 231	2012306 SL11d_emb 232						
27 (r11)	2012105 SL11d_emb 251	2012106 SL11d_emb 252					20122404 SL11d_emb 253	
39 (r10)	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)		2012402 SL10k_emb 183		2012401 SL10k_emb 182	20122402 SL10k_emb 185	
62.4 (r10)	20123809 <i>SL10k_embUPD</i> 171	20123810 <i>SL10k_embUPD</i> 172						
200 (r10)	2011601 SL10k_emb 162 (jetcorr)	2011601 SL10k_emb 166 (jetcorr)	2012401 SL10k_emb 164	20101706 SL10k_emb 161		20101708 SL10k_emb 163	20122403 SL10k_emb 165	
200 (r11)								

56(64) particle/root-s combinations needed ... 18 embedding productions available, 9 “mine”

	p	pbar	d	dbar	t	tbar	h	hbar
7.7	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)	2012401 SL10k_emb 164	2012402 SL10k_emb 183	2012401 SL10k_emb 182 ←	2012401 SL10k_emb 182	20122402 SL10k_emb 185	20122402 SL10k_emb 185 →
11.5	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)	2012401 SL10k_emb 164	2012402 SL10k_emb 183	2012401 SL10k_emb 182 ←	2012401 SL10k_emb 182	20122402 SL10k_emb 185	20122402 SL10k_emb 185 →
19.6	2012305 SL11d_emb 231	2012306 SL11d_emb 232					20122404 SL11d_emb 253	20122404 SL11d_emb 253 →
27	2012105 SL11d_emb 251	2012106 SL11d_emb 252					20122404 SL11d_emb 253	20122404 SL11d_emb 253 →
39	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)	2012401 SL10k_emb 164	2012402 SL10k_emb 183	2012401 SL10k_emb 182 ←	2012401 SL10k_emb 182	20122402 SL10k_emb 185	20122402 SL10k_emb 185 →
62.4	20123809 SL10k_embUPD 171	20123810 SL10k_embUPD 172	2012401 SL10k_emb 164	20101706 SL10k_emb 161	20101708 SL10k_emb 163 ←	20101708 SL10k_emb 163	20122403 SL10k_emb 165	20122403 SL10k_emb 165 →
200 (r10)	2011601 SL10k_emb 162 (jetcorr)	2011601 SL10k_emb 166 (jetcorr)	2012401 SL10k_emb 164	20101706 SL10k_emb 161	20101708 SL10k_emb 163 ←	20101708 SL10k_emb 163	20122403 SL10k_emb 165	20122403 SL10k_emb 165 →
200 (r11)								

pbar 39: 20103206 (181, SL10h_emb) 2012403 (184) 2012601 (187)
pbar 7.7: 20103604 (191, SL10h_emb) RM-matched 2012601 (187)

RM-matched

RM-matched &/or Abs-scaled

	p	pbar	d	dbar	t	tbar	h	hbar	
7.7	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)	2012401 SL10k_emb 164	2012402 SL10k_emb 183	2012401 SL10k_emb 182 ←	2012401 SL10k_emb 182	20122402 SL10k_emb 185	20122402 SL10k_emb 185 →	
11.5	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)	2012401 SL10k_emb 164	2012402 SL10k_emb 183	2012401 SL10k_emb 182 ←	2012401 SL10k_emb 182	20122402 SL10k_emb 185	20122402 SL10k_emb 185 →	
19.6	2012305 SL11d_emb 231	2012306 SL11d_emb 232	scale by RM, Abs, and r11/r10 ...scale up by 4-9% depending on cuts					20122404 SL11d_emb 253	20122404 SL11d_emb 253 →
27	2012105 SL11d_emb 251	2012106 SL11d_emb 252							
39	2012601 SL10k_emb 186 (jetcorr)	2012601 SL10k_emb 187 (jetcorr)	2012401 SL10k_emb 164	2012402 SL10k_emb 183	2012401 SL10k_emb 182 ←	2012401 SL10k_emb 182	20122402 SL10k_emb 185	20122402 SL10k_emb 185 →	
62.4	20123809 SL10k_embUPD 171	20123810 SL10k_embUPD 172	2012401 SL10k_emb 164	20101706 SL10k_emb 161	20101708 SL10k_emb 163 ←	20101708 SL10k_emb 163	20122403 SL10k_emb 165	20122403 SL10k_emb 165 →	
200 (r10)	2011601 SL10k_emb 162 (jetcorr)	2011601 SL10k_emb 166 (jetcorr)	2012401 SL10k_emb 164	20101706 SL10k_emb 161	20101708 SL10k_emb 163 ←	20101708 SL10k_emb 163	20122403 SL10k_emb 165	20122403 SL10k_emb 165 →	
200 (r11)									

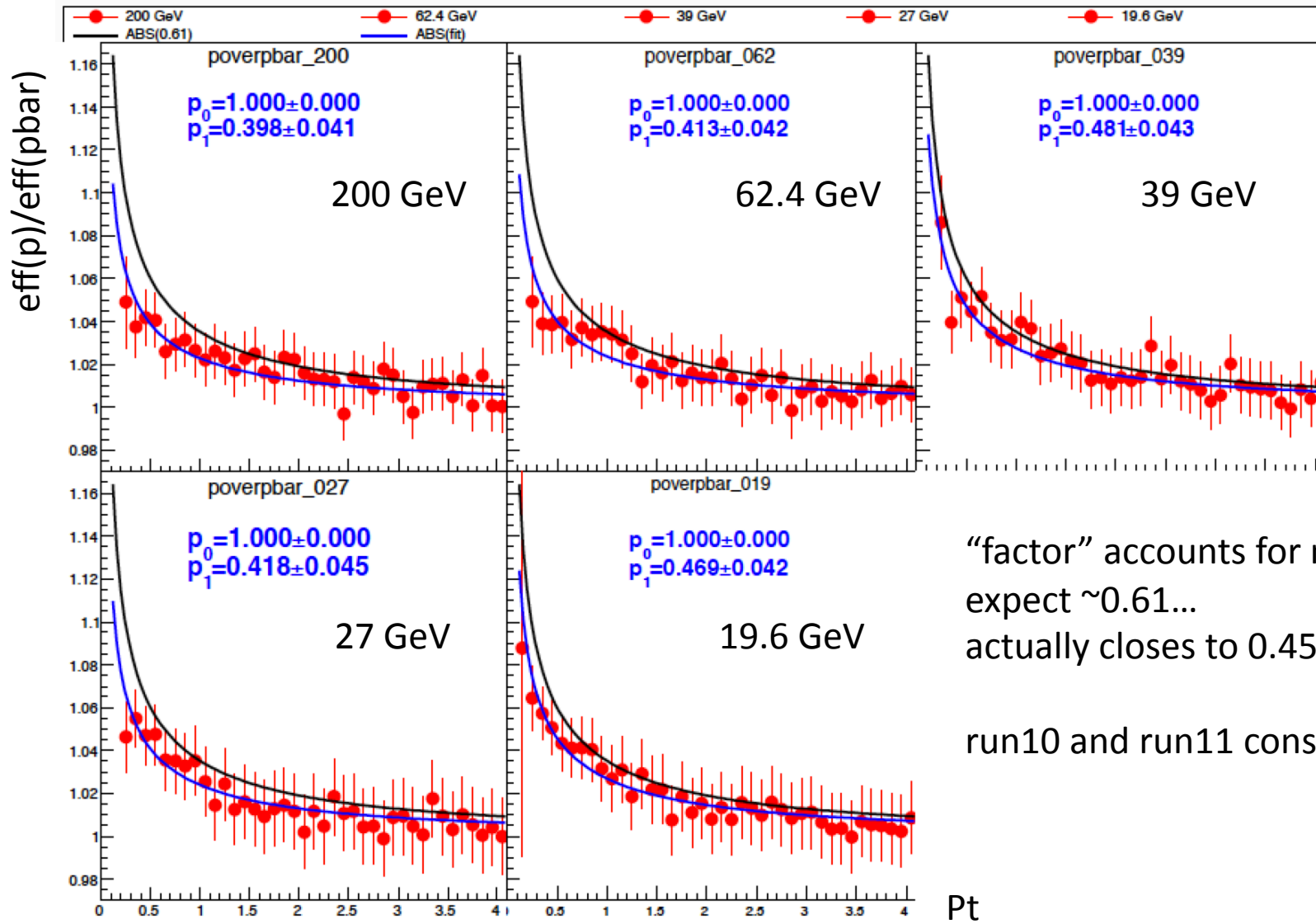
pbar 39: 20103206 (181, SL10h_emb) 2012403 (184) 2012601 (187)
pbar 7.7: 20103604 (191, SL10h_emb) RM-matched 2012601 (187)

RM-matched

RM-matched &/or Abs-scaled

issues...

Absorption from pbar & p embedding implies slightly less material than expected



“factor” accounts for material
expect ~ 0.61 ...
actually closes to 0.45...

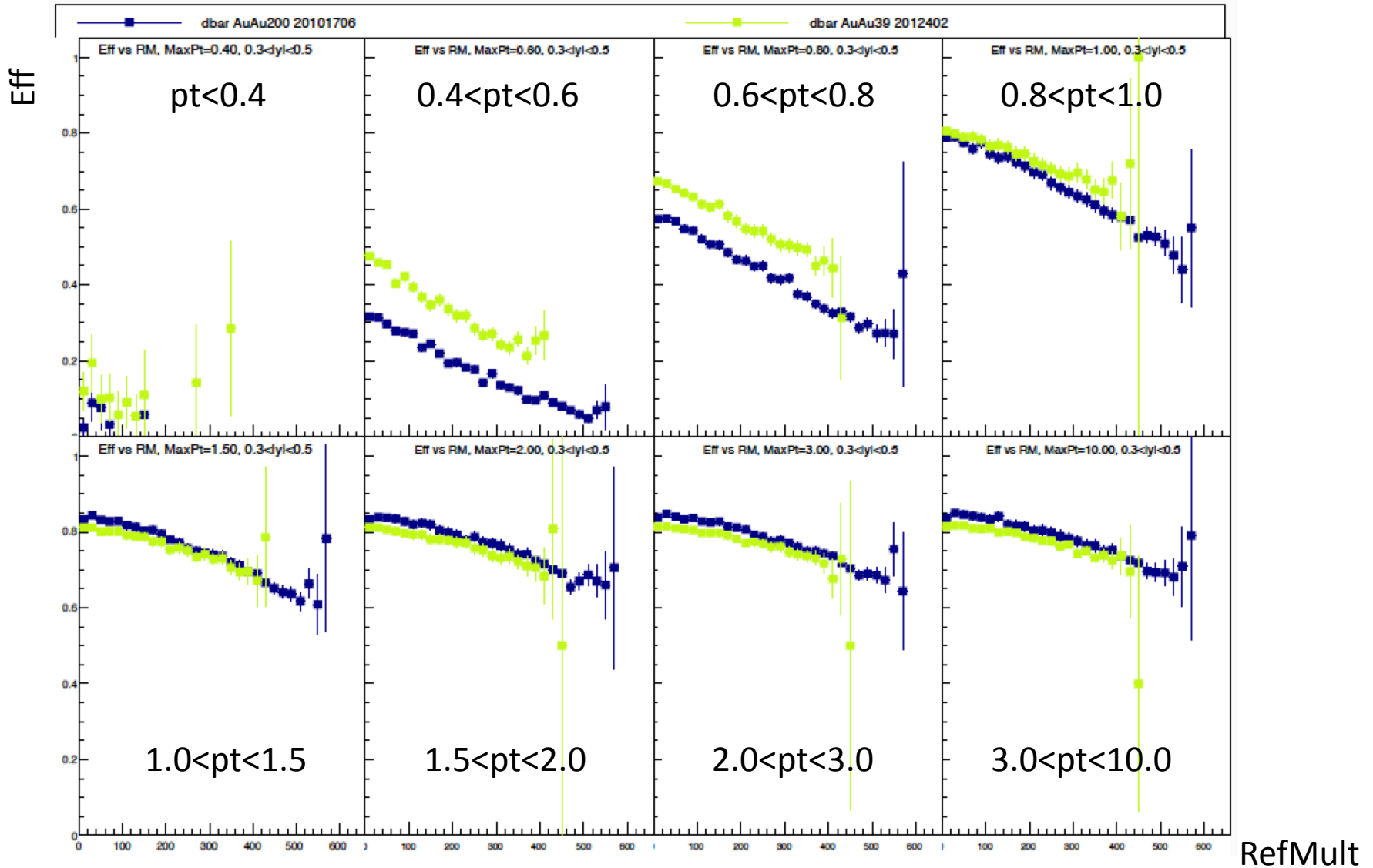
run10 and run11 consistent

P_t

issues...

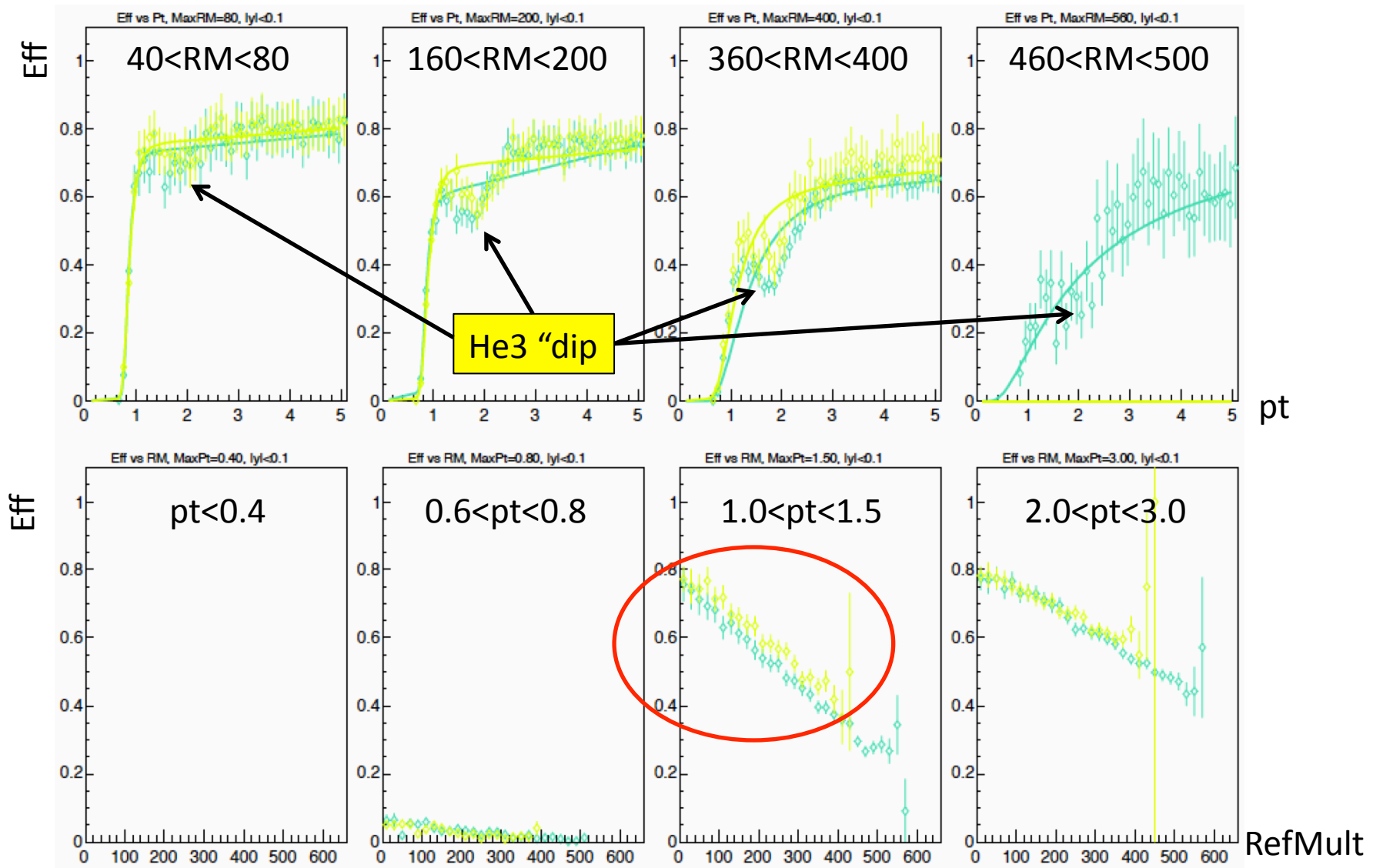
$|y| < 0.3$: RM-scaling holds only to $\sim 5\%$ for cuts set1 (loose), poorer for others

$0.3 < |y| < 0.5$: **RM-scaling breaks badly**



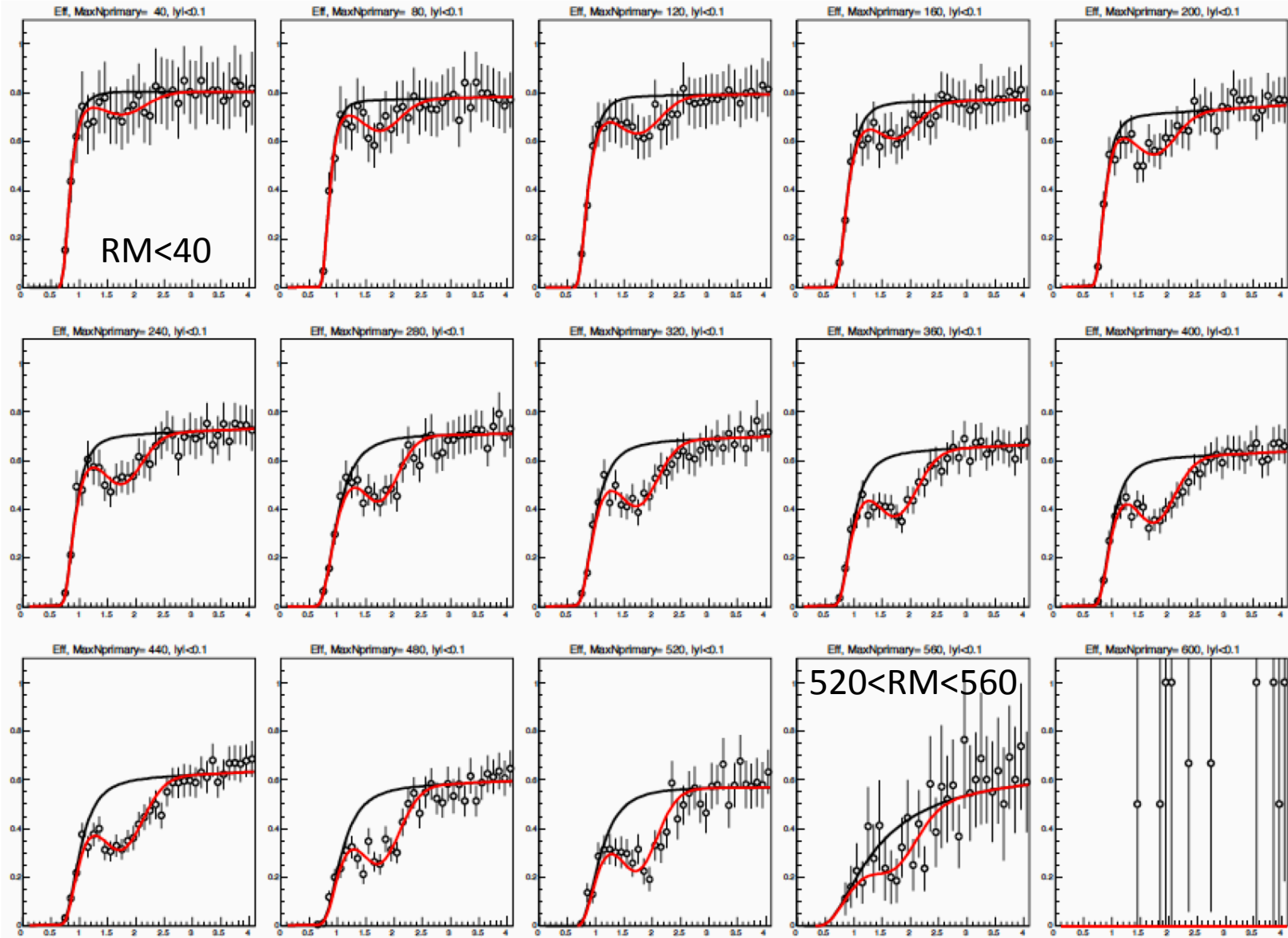
issues...

He3 scaling not great even for $|y| < 0.1$, and there's a dip at $pt \sim 1.75$



issues...

He3 “hole” @pt~1.75 for $|y|<0.1$ & $0.1<|y|<0.3$ – now fitting explicitly



Summary

now back to doing analysis after ~3 months of Run-13 hardware work

need 56 efficiency corrections, 18 of which exist as embedding productions.

filling out the corrections table requires careful:

RM-scaling, Abs-scaling, run-11/run-10 scaling

...this is the present focus.

timescale...

~1 week to fully test implementation of combined efficiency/absorption table

~4 weeks to rerun analysis codes all seven root-s values for each of 5 cuts sets

~2 weeks of “fitPID” to produce spectra, ratios, B_A & R_G , etc...

along the way,

update TOFmatch corrections

check centrality-dependence of the feeddown corrections

Will update on the new corrections at upcoming lfpsectra meeting...