Improving MC Reconstruction Efficiency

12/03/2012

MC Eff.

- Patrick and I have been looking at the reconstruction efficiency for the Lc->pKpi and Xicc+->LcKpi.
- As a first step Patrick generated ntuples for the modes with both MCDecayTreeTuple and MCMATCH cheating.
- We then looked at the numbers of candidates for which all daughters were successfully reconstructed with charged long tracks by MCDTT and compared them to the cheated candidates.
- For Lc have all Lc and just prompt Lc.
- For Xicc have all Lc (even if associated Xicc was not successfully reconstructed) and Xicc.

Number Crunching

Lc Prompt from Lc->pKpi:

	Events	% of events
CHEATED (MCMATCH)	512512	-
Total events from MCDecayTreeTuple	2309196	-
All daughters reconstructed (MCDecayTreeTuple)	520006	22.5
All daughters have associated protoparticles (MCDecayTreeTuple)	817844	35.4

All Lc from Lc->pKpi job:

	Events	% of events
CHEATED (MCMATCH)	565095	-
Total events from MCDecayTreeTuple	2531013	-
All daughters reconstructed (MCDecayTreeTuple)	572920	22.6
All daughters have associated protoparticles (MCDecayTreeTuple)	898812	35.5

Lc from Xicc Job:

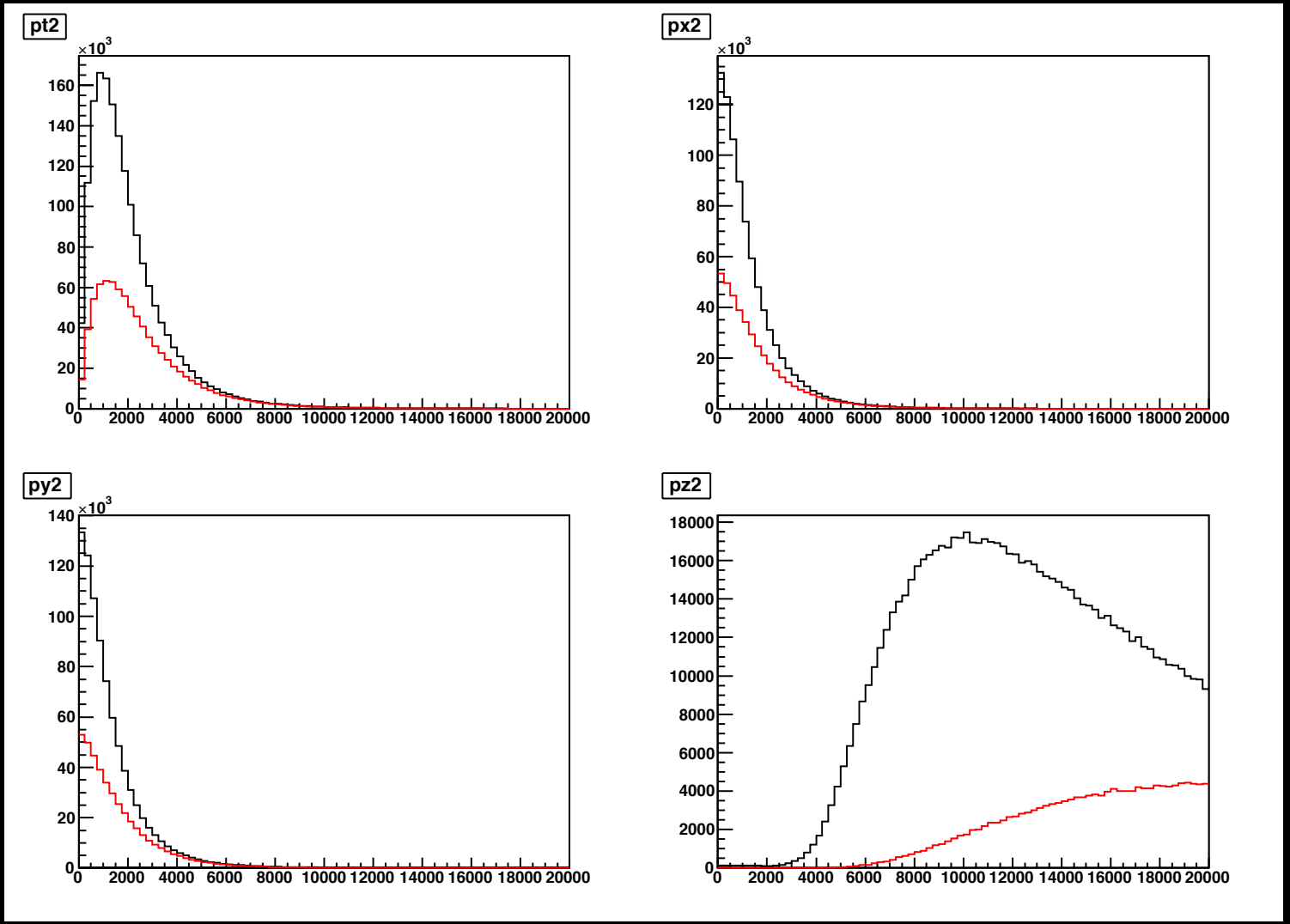
	Events	% of events
CHEATED (MCMATCH)	164012	-
Total events from MCDecayTreeTuple	729202	-
All daughters reconstructed (MCDecayTreeTuple)	161237	22.1
All daughters have associated protoparticles (MCDecayTreeTuple)	258593	35.4

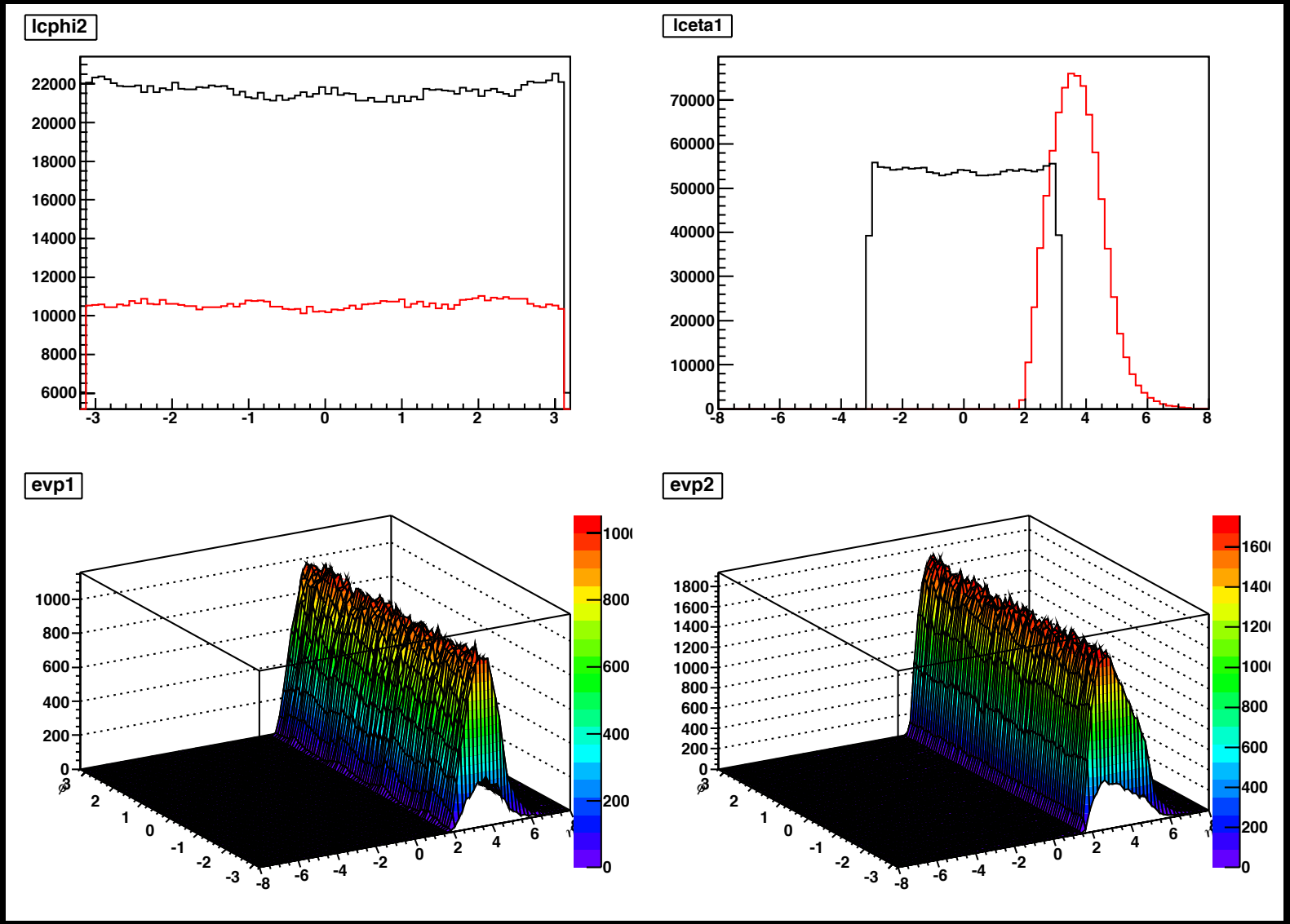
Xicc:

	Events	% of events
CHEATED (MCMATCH)	62191	-
Total events from MCDecayTreeTuple	724464	-
All daughters reconstructed (MCDecayTreeTuple)	60634	8.3
All daughters have associated protoparticles (MCDecayTreeTuple)	133793	18.5

- So we largely get what we expect, but we should improve on the low 8% yield of our Xicc at the generator level!
- Next we have looked at quantities to do with the parent and daughter particles which might explain why so few generated particles are successfully reconstructed.
- So far have got some plots for Lc, Xicc plots on the way.

Lc mother plots: Red = all daughters reconstructed, black one or more lost.




lcphi2
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lceta1
70000
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evp2
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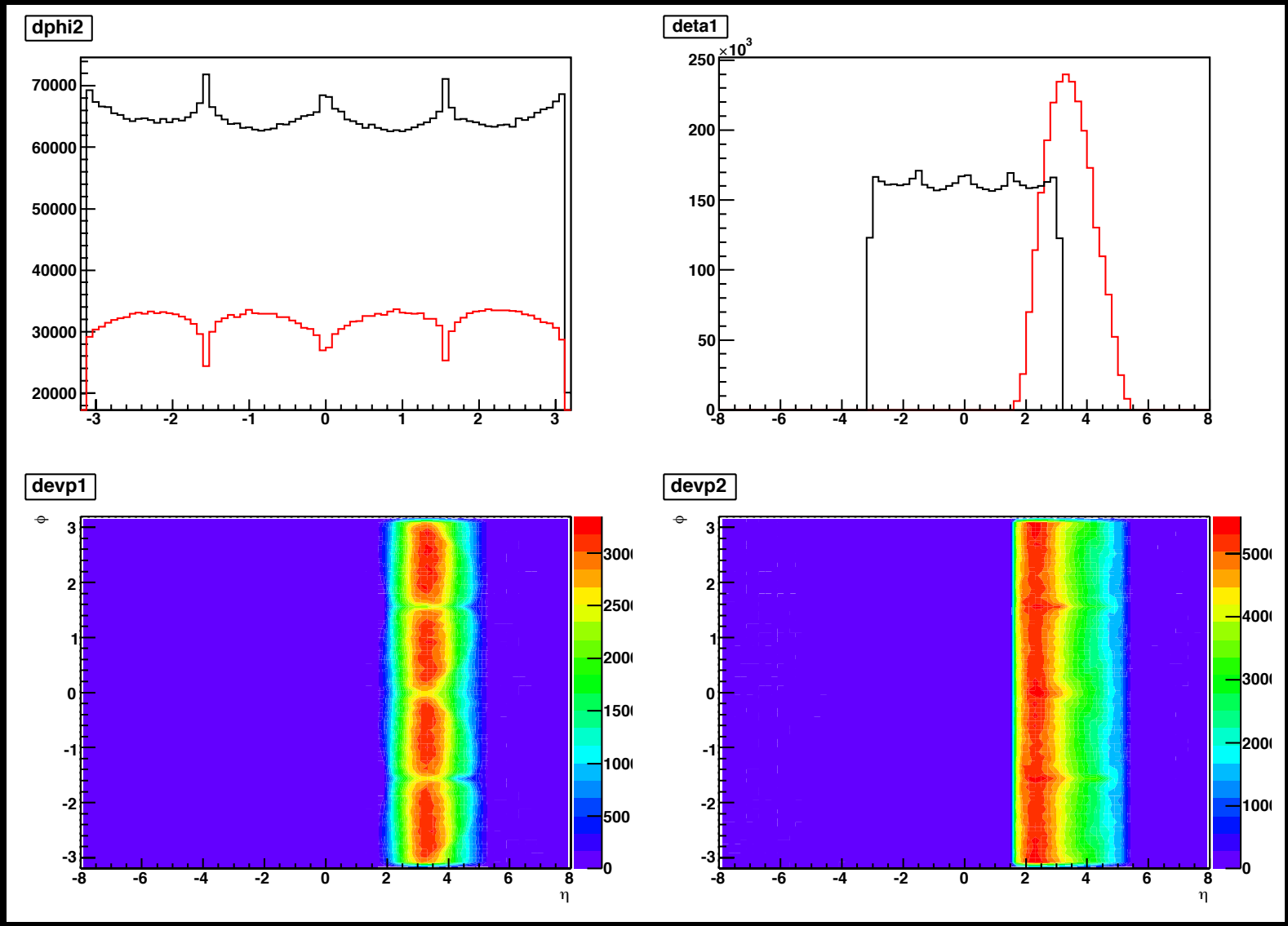
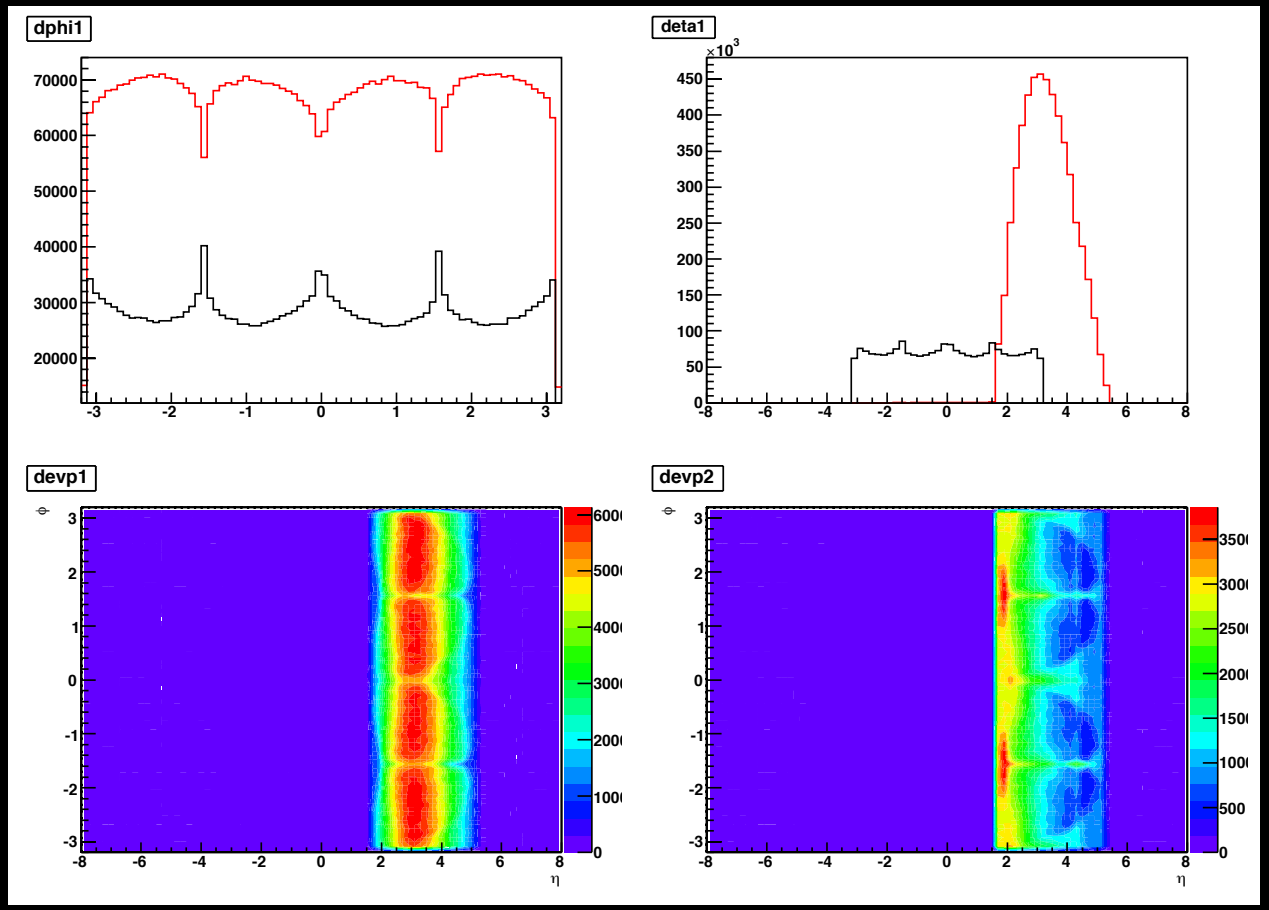
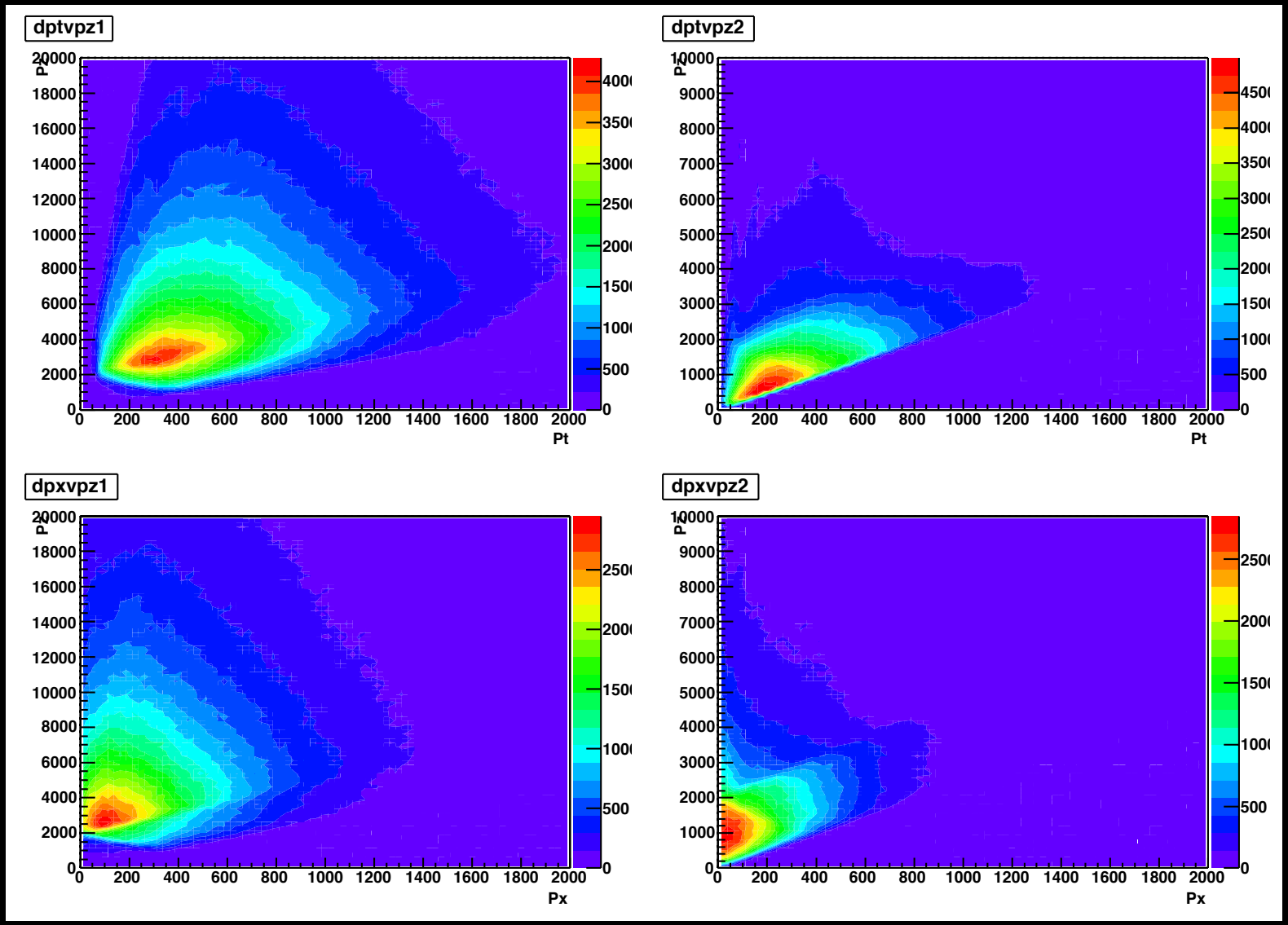
Daughters – eta, phi -> red = all daughters reconstructed



Red = individual daughter reconstructed regardless of other daughters in the event




dptvpz1
Pz
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