Kink sample and Photon Veto

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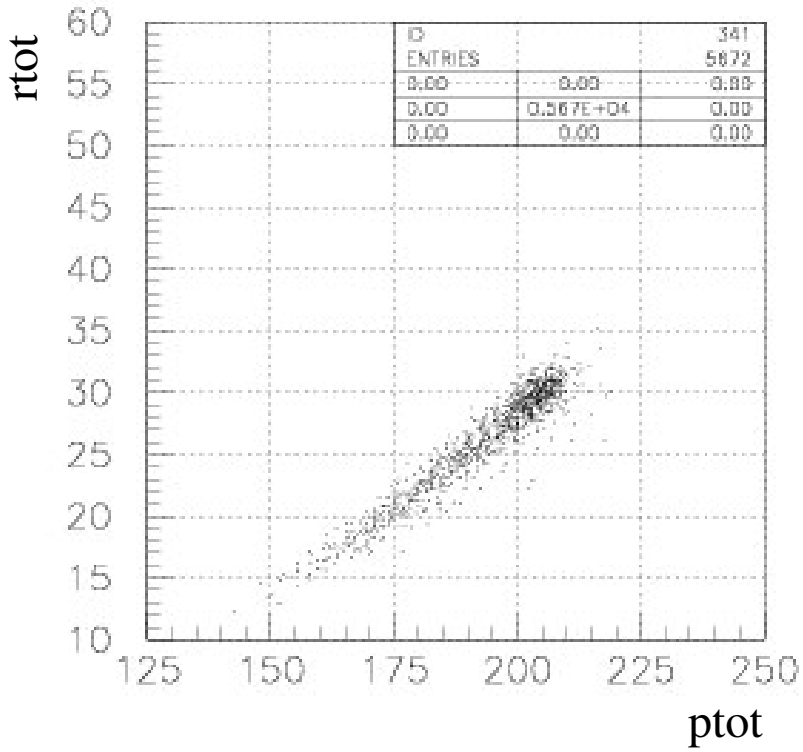
Goals

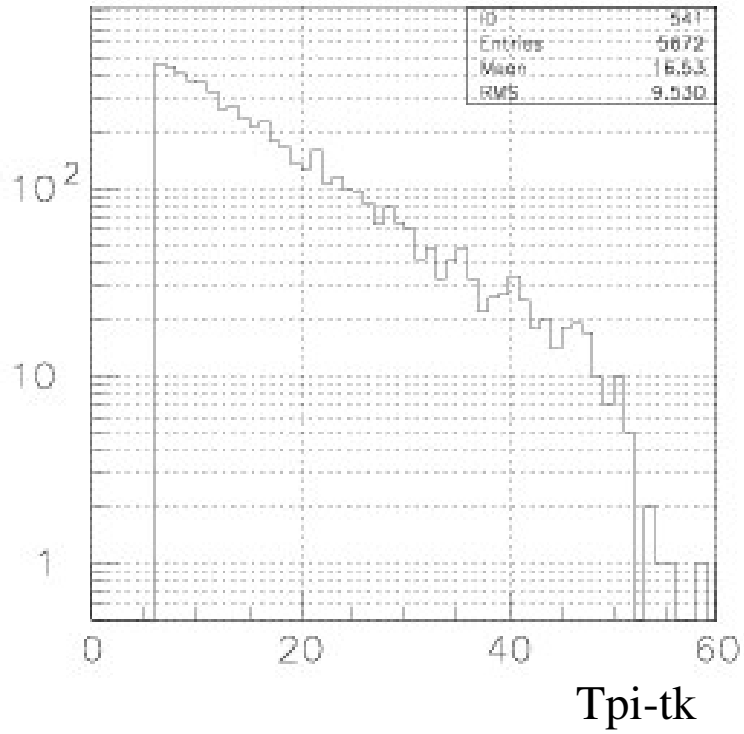
- Prepare appropriate Kp2-scatter ("kink") sample to measure the PV rejection on. There are 2 kinds ok kinks:
  - "xy" – can see a scattering in the xy-view of the target. Tagged by target quality cuts, Benji's kink-finding code, cuts on the results of Toshio's fitter.
  - *"z" – pion starts off in the beam direction, hides under K fibers. Tagged by CCDPUL cut.*
  - In the 96-97 analysis, several kink samples were prepared with combinations of these cuts and the PV was measured on them.
- Measure the PNN1 PV rejection on this sample (baseline)
- Improve it & optimize it:
  - Cut (extra) on early BV hits
  - Active Degrader
  - BVL TD hits
  - Downstram PV?
- Measure the PNN2 PV rejection on a final sample (preferably rich in z-kinks, tagged by CCDPUL-bar?)

What has been done - sample

- Cannot trust target pulse fitting yet, so CCDPUL was not used. Removed target quality cuts that specifically reject xy-kinks, trying to increase the sample. Got a total of ~5.6k kinks, ~850 of them in the PNN2BOX.

- Applied PV on them.





Rtot vs ptot & DELCO for xy-kinks, before PV

CUTS	no box, no DELCO	PNN2BOX	DELCO6	kinks
	14380203	2243017	5695184	1034785
SKIM1	2839364	464483	1483723	101462
RECON	2506718	394217	1301095	83475
KINCUTS	1082978	152331	676433	38354
PSCUT02_KINK	683203	61559	556018	17332
TDCUT02	0	0	0	0
Ptot<225	681954	61559	554964	17324
B4TIM	0	0	0	0
B4EKZ(IC)	0	0	0	0
TGZFOOL	681906	61540	554921	17322
EPITG	0	0	0	0
EPIMAXK	0	0	0	0
TARGF	658396	55566	535734	16849
DTGTTP	658325	55555	535671	16849
RTDIF	650975	54750	529637	16415
DRP	0	0	0	0
TGKTIM	644410	53960	528481	16268
EIC	626842	51696	513925	15826
TIC	626838	51696	513922	15826
TGEDGE	611314	49407	501531	15357
TGDEDX	0	0	0	0
TGENR	0	0	0	0
PIGAP	601129	48138	493195	15062
TGB4	559696	42201	460443	11091
PHIVTX	513582	25083	418971	7304
OPSVETO	466689	21640	379480	7036
TIMKF	466689	21640	379480	7036
TGER	466689	21640	379480	7036
NPITG	454718	21089	368287	7036
TGLIKE	0	0	0	0
ALLKFIT	451064	20922	365305	7009
TPICS	389223	19123	314801	7009
EPIONK	0	0	0	0
DELCO6	314801	15549	314801	5672
PVCUT	310322	15175	310322	5561
KINKCUT	304761	13000	304761	0
CCDPUL	304761	13000	304761	0
CCDPUL	314801	11875 15549	314801	5672
KINKCUT	5672	853 2219	5672	5672
PVCUT	111	44	111	111

Kink sample & PV
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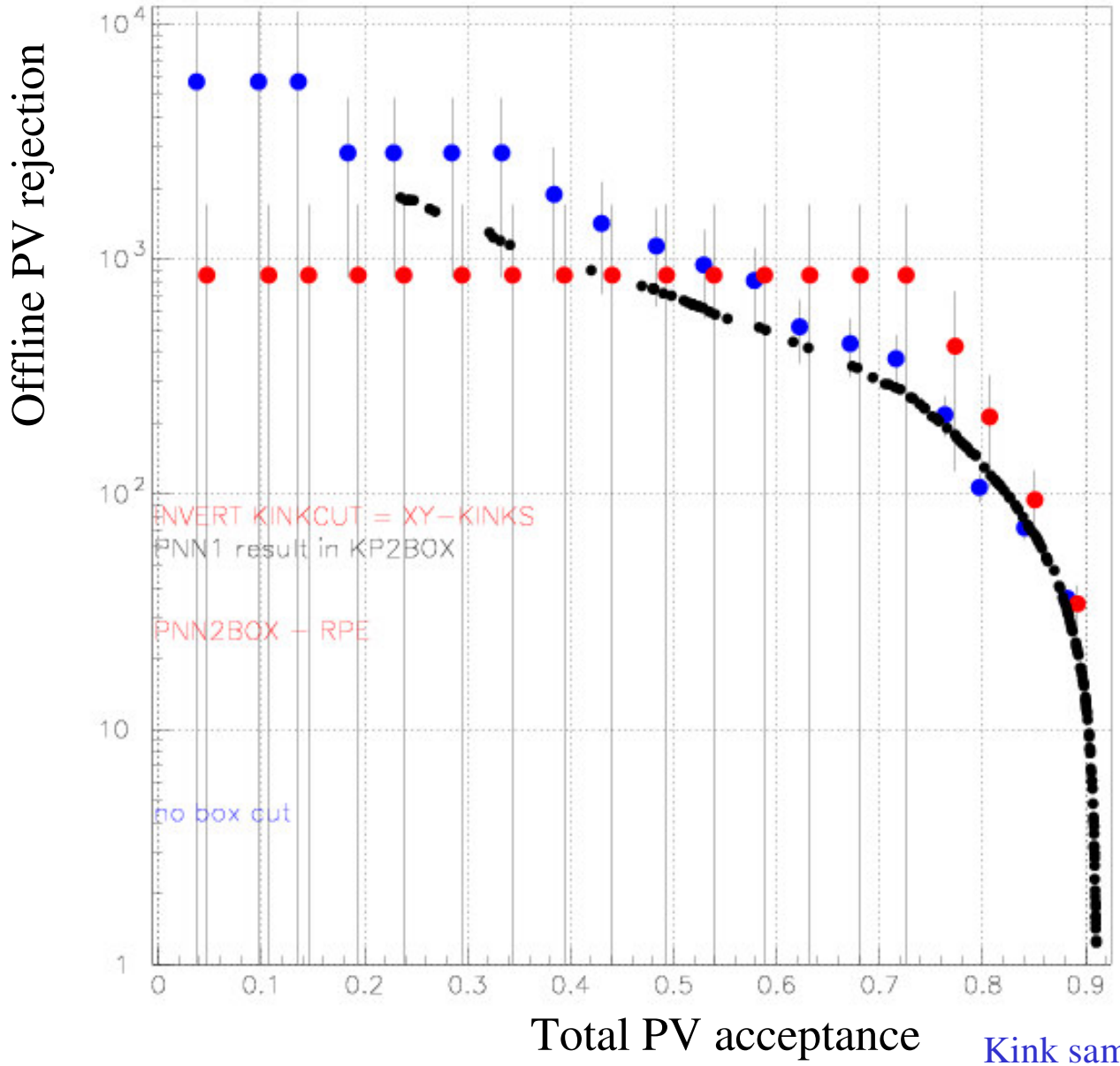
What has been done – baseline PV



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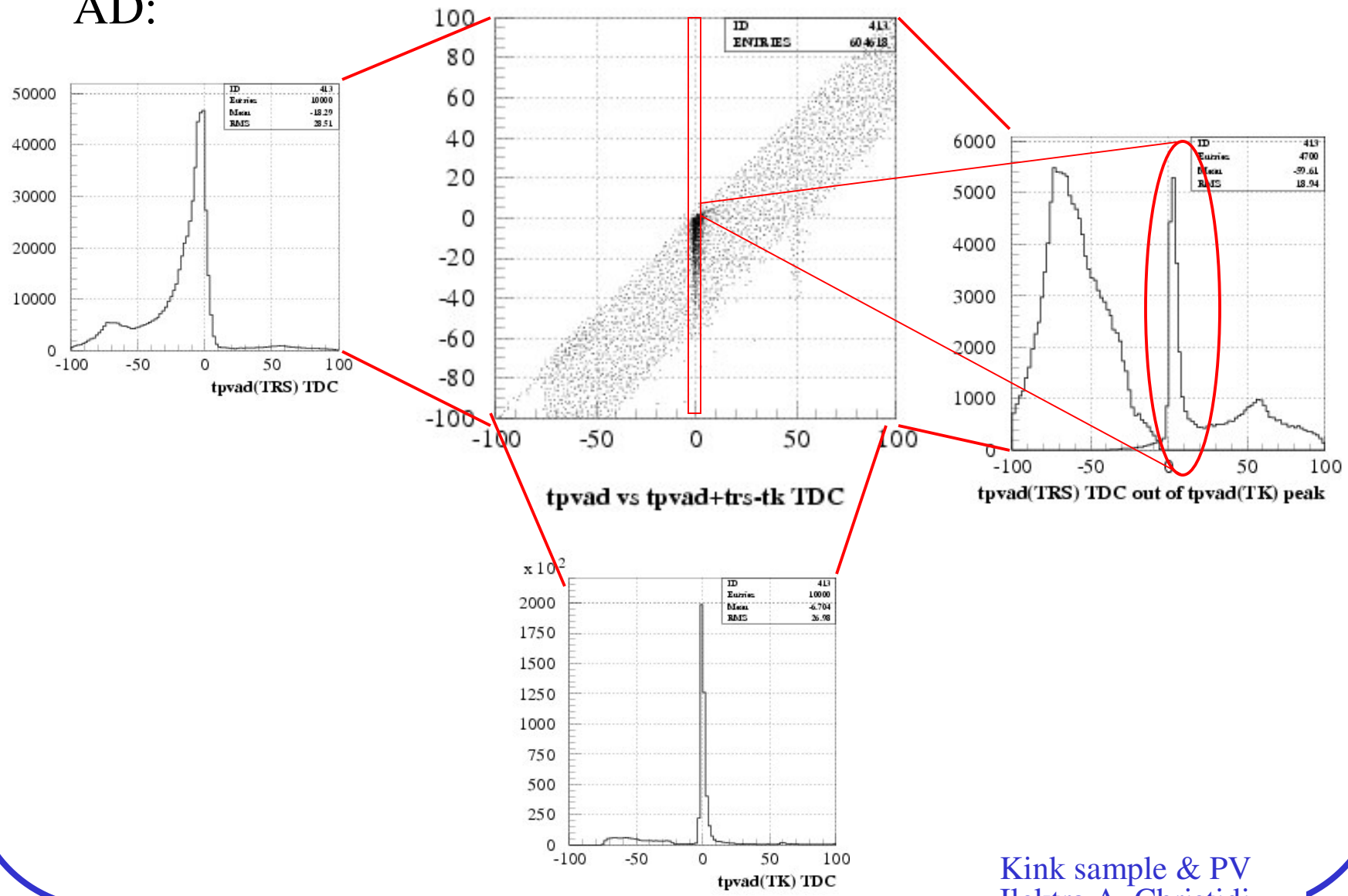
What has been done – improve PV

AD:



Future

- Purification of PV-measurement sample under good progress.

Next step: tag z-kinks in this sample, without using CCDPUL.

- New PV tools have been developed (AD, early BV, BVL TDs), tune them. Look at DPV.
- Machinery ready for a Kp2-scatter background calculation.
- Problem: **statistics**
  - Shall we be able to optimize the PV parameters? Need ~10k events. Can tune by eye instead, or tune on 3/3, or…?
  - Still checking the applied cuts for acceptance loss anyways