

Separation power resp. mis id levels

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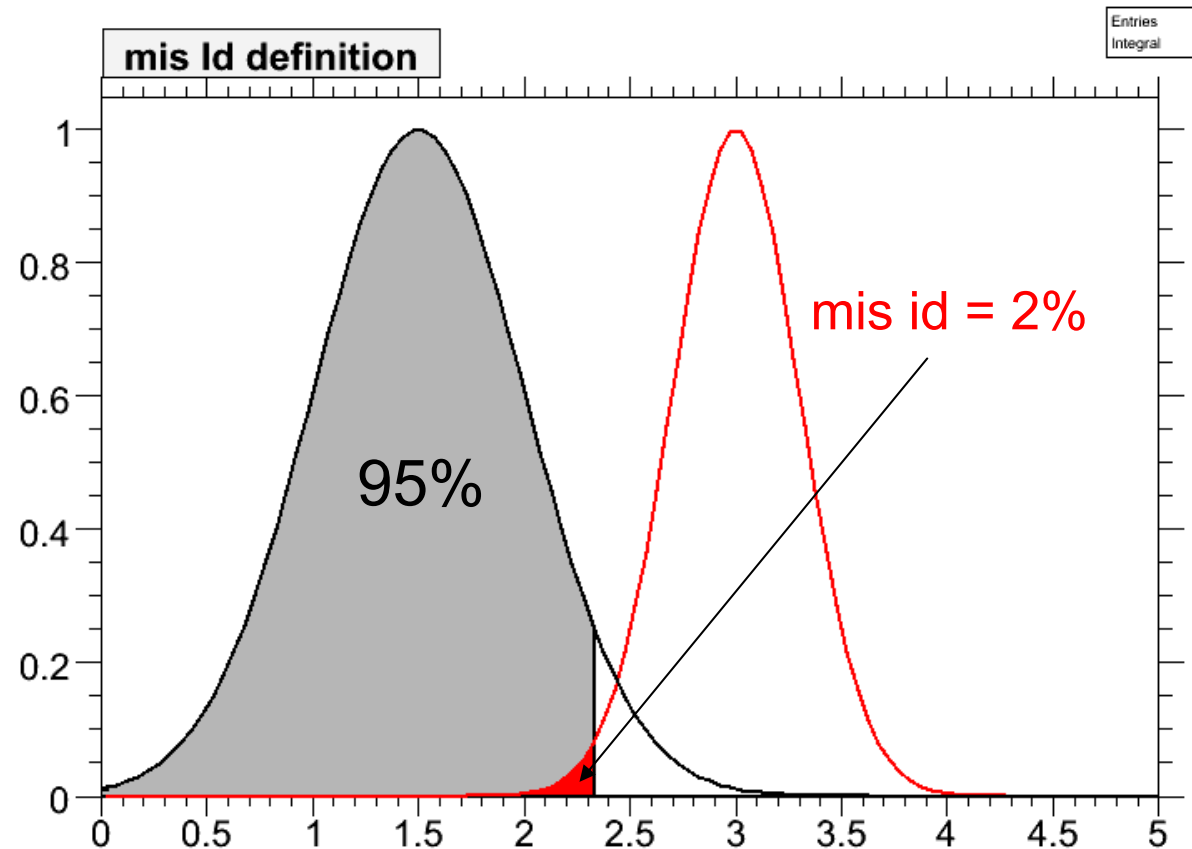
- Finer binning ($d\theta=1^\circ$, $dp=100$ MeV/c)
- Separation power vs. mis id level
- Positive identification (both particles have to produce a signal; otherwise no Id)
- Usage of detailed DIRC trapping fractions
- Included maps from Klaus Foehl for Disc DIRC (π -K-separation only)

- Divide 2-D p, θ region into bins
- for every bin & every 2 PID hypothesis
($e-\mu / \mu-\pi / \pi-K / K-p / e-\pi$)
 - determine mean values μ_i and RMS r_i for both hypothesis (e.g. π and K)
 - separation power (number sigmas) is estimated as

$$n_\sigma = \frac{|\mu_\pi - \mu_K|}{\max(r_\pi, r_K)}$$

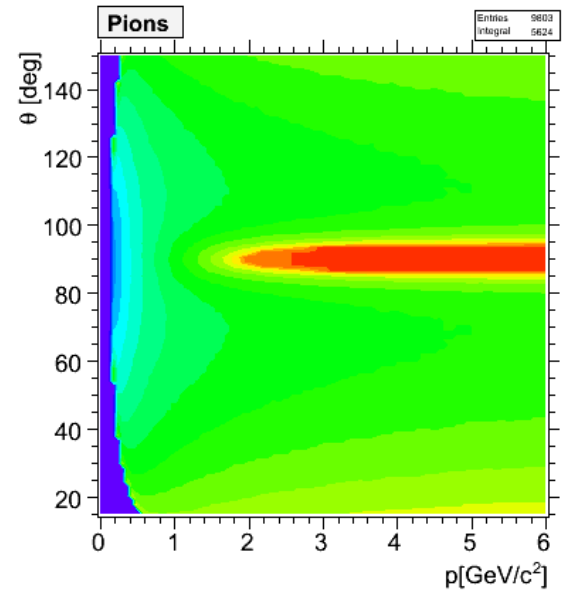
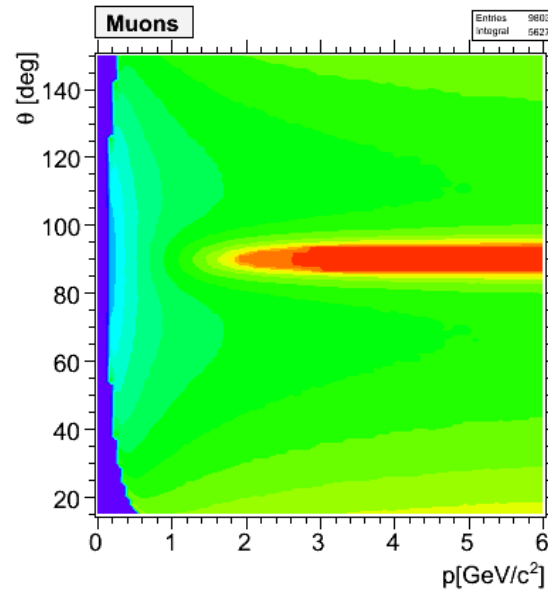
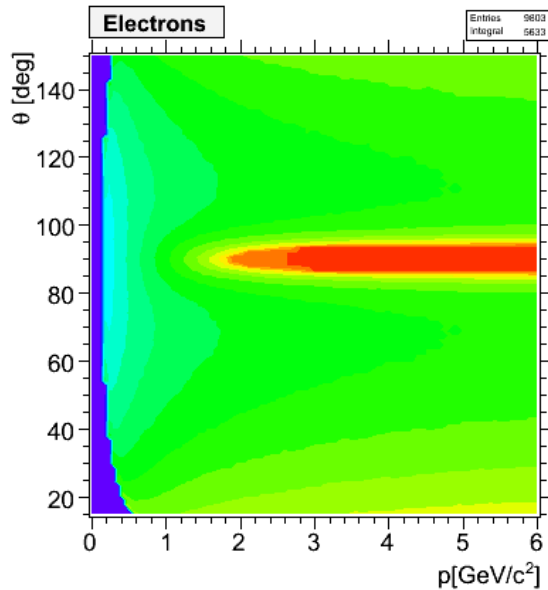
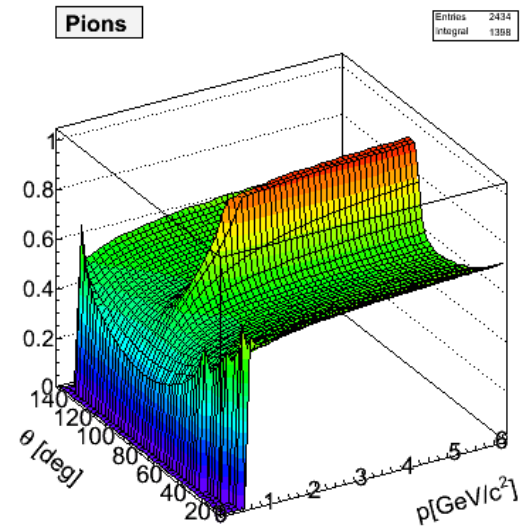
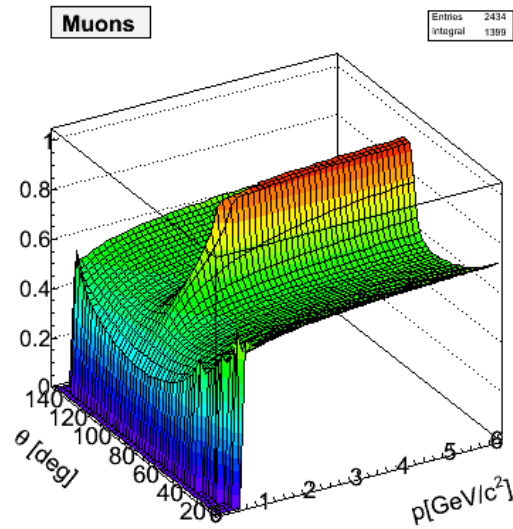
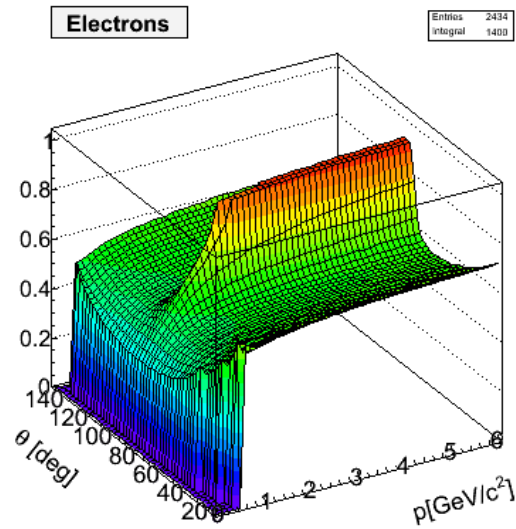
- colorize a 2-D map according to n_σ

- determine mean values μ_i and RMS r_i for both hypothesis (e.g. π and K)
 - Integrate signal distribution up to 95% of area
 - **Integral of bkg** up to this point normalized to total bkg is mis id level

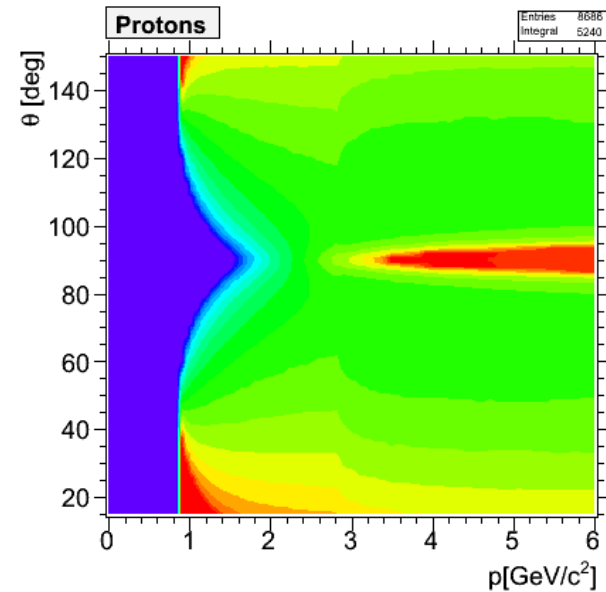
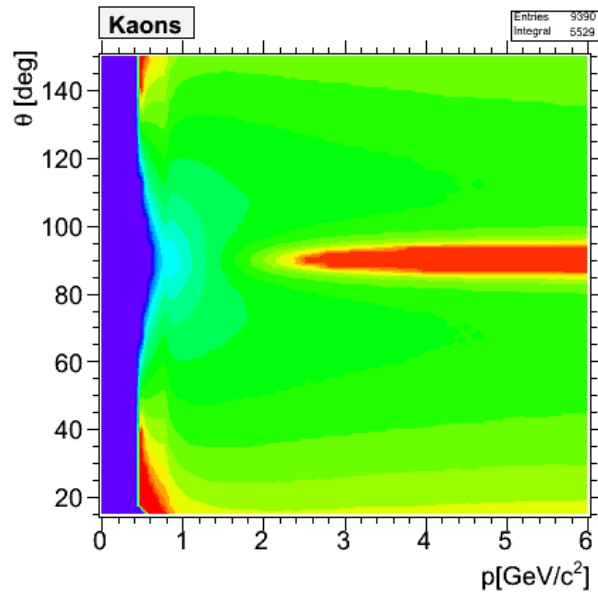
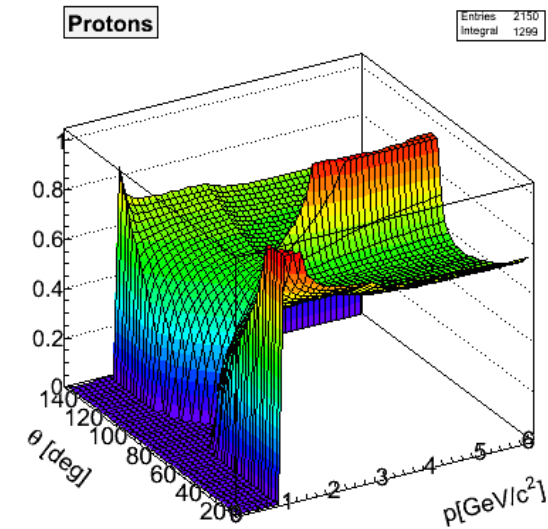
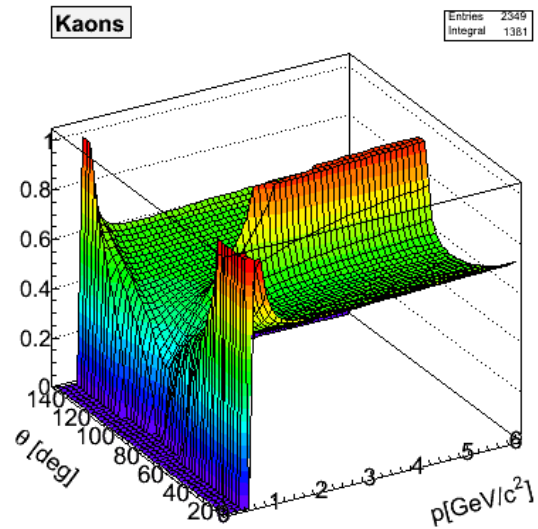


- has to be done in both directions (asymmetric!)

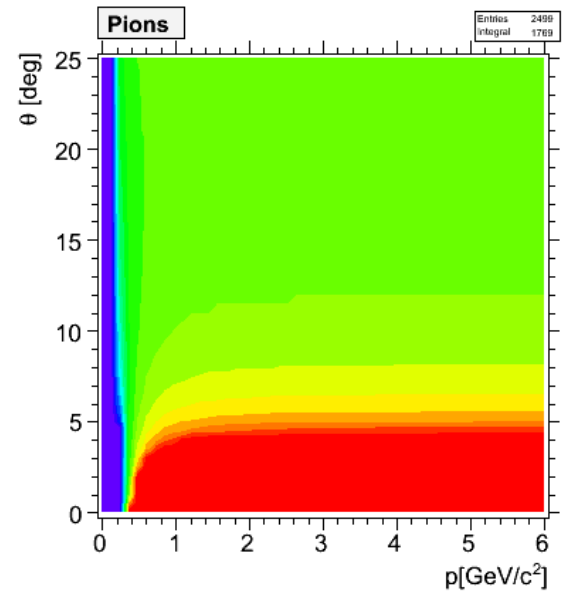
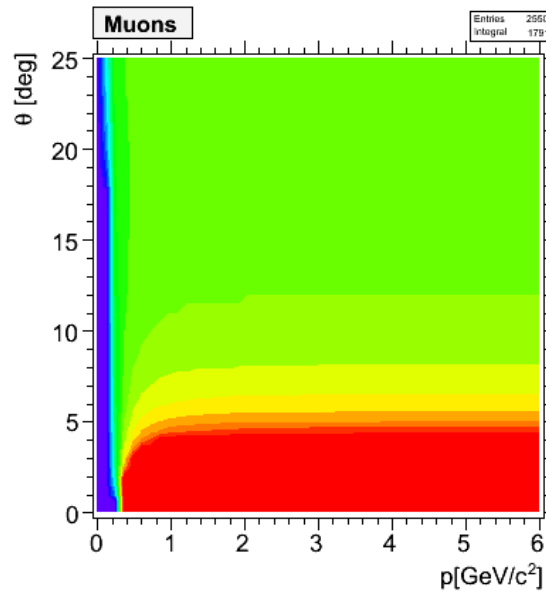
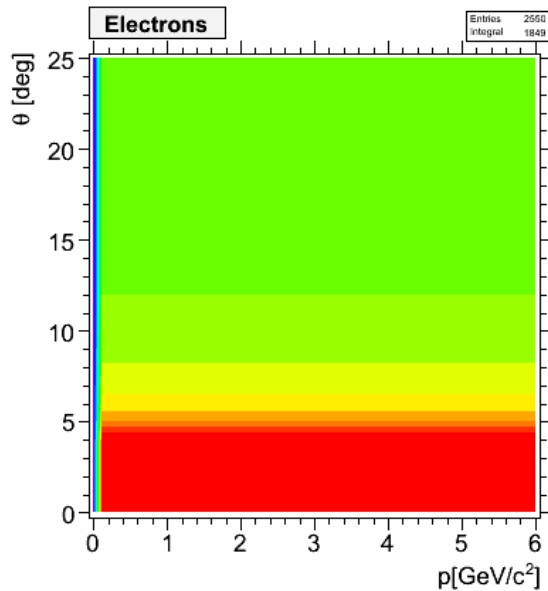
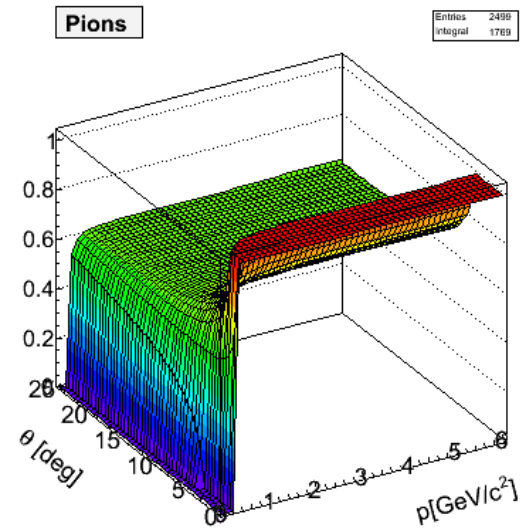
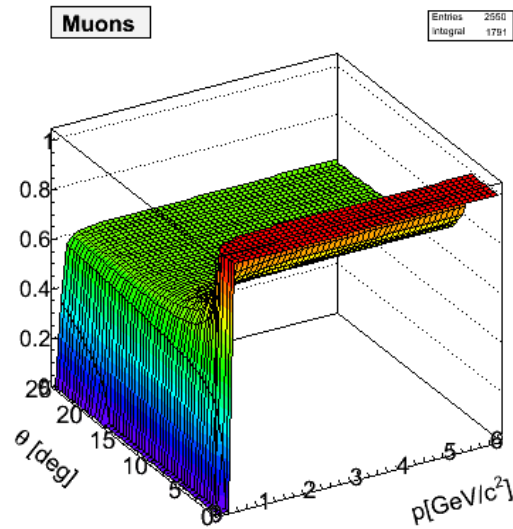
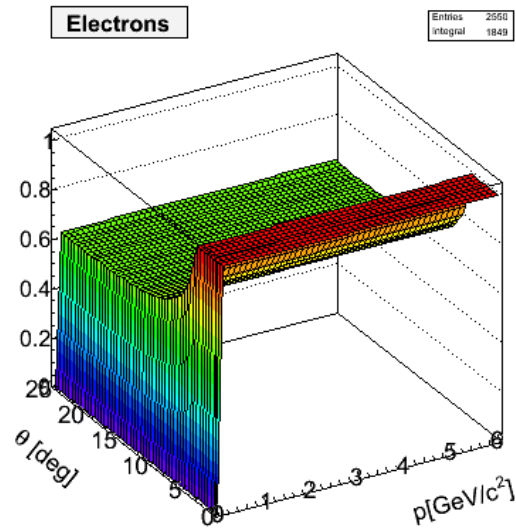
Trapping fraction barrel (e, μ, π)



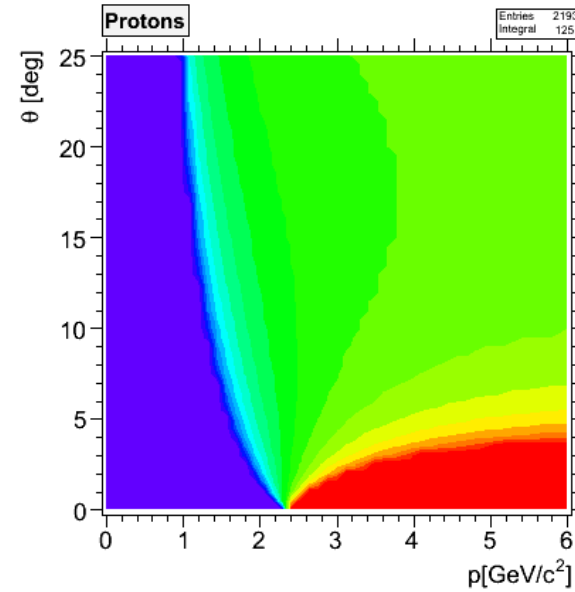
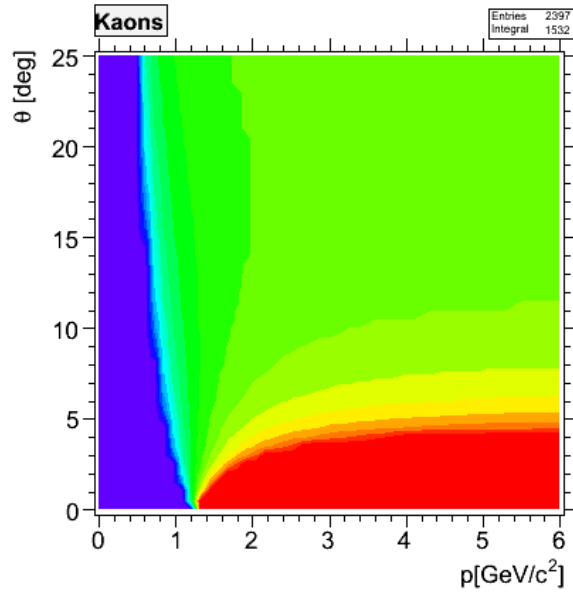
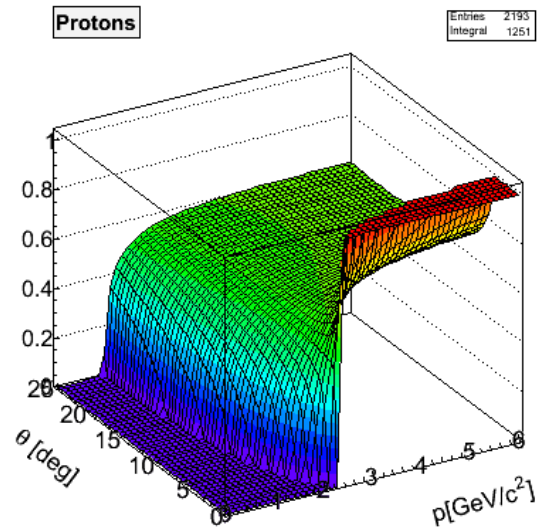
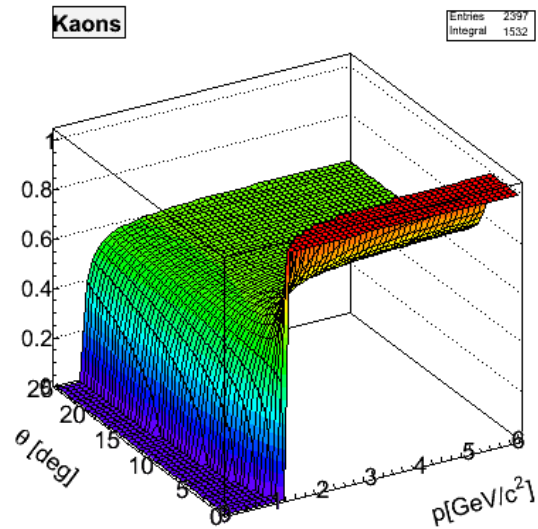
Trapping fraction barrel (K,p)



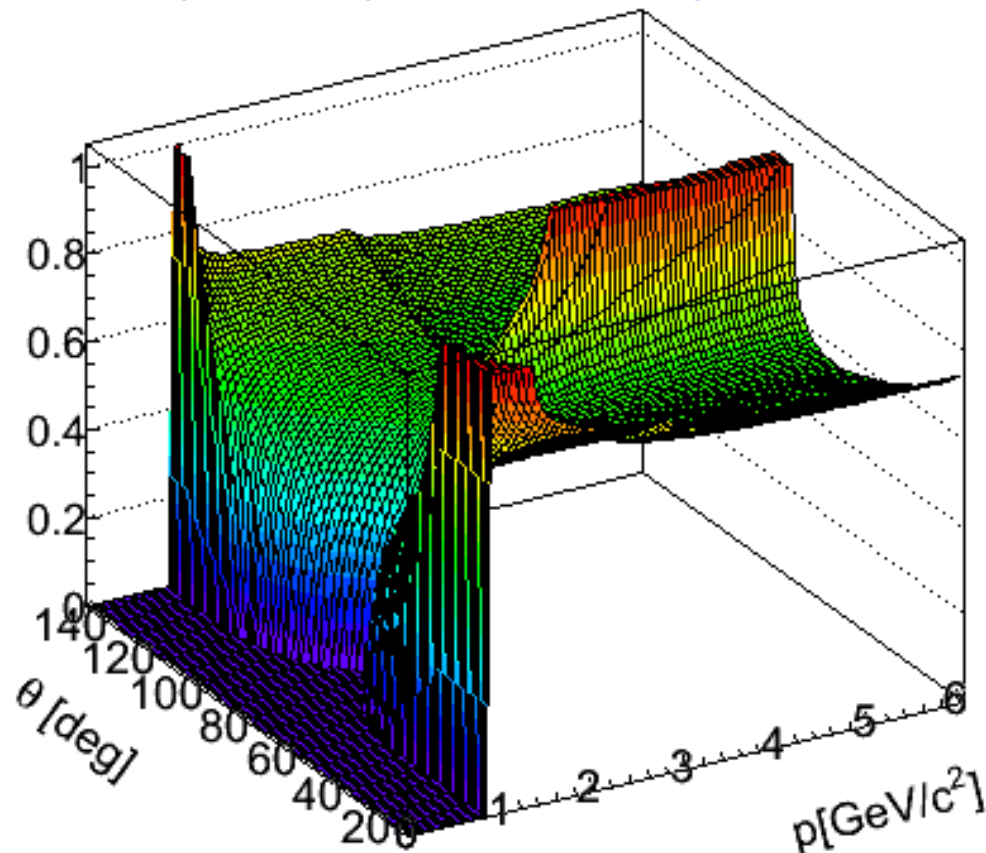
Trapping fraction disc (e, μ , π)

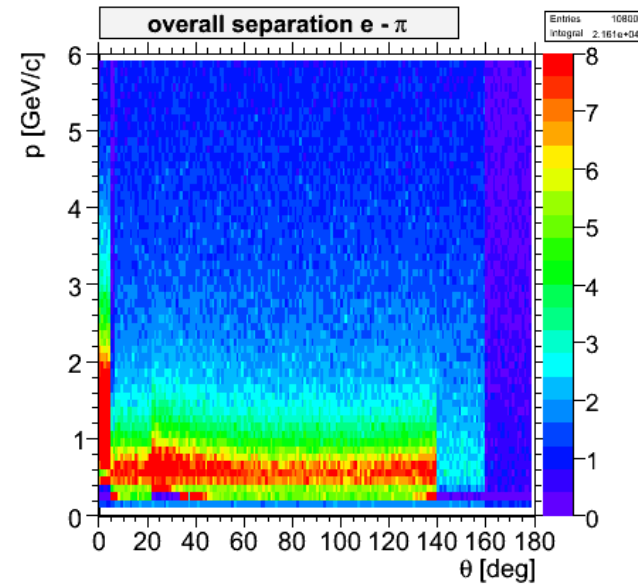
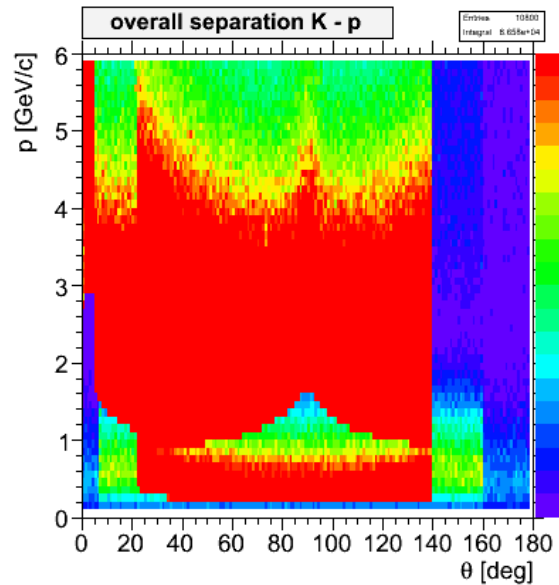
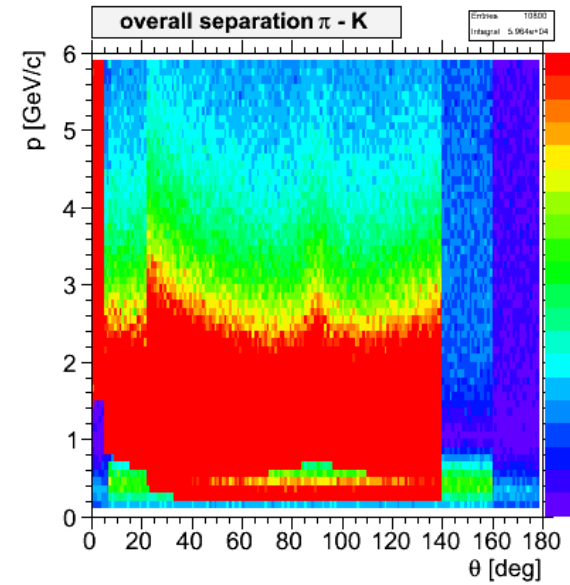
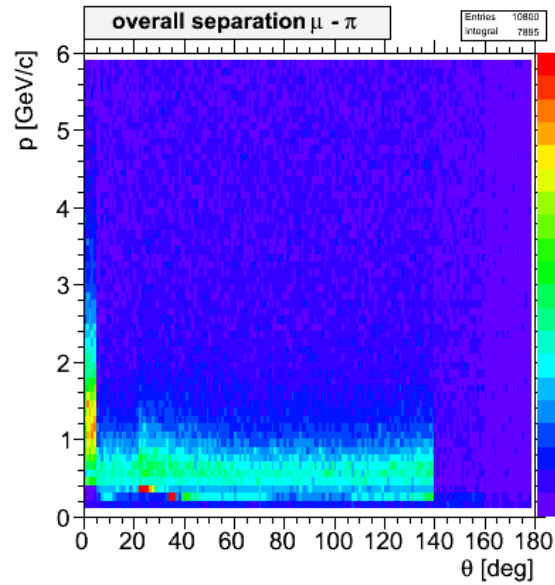
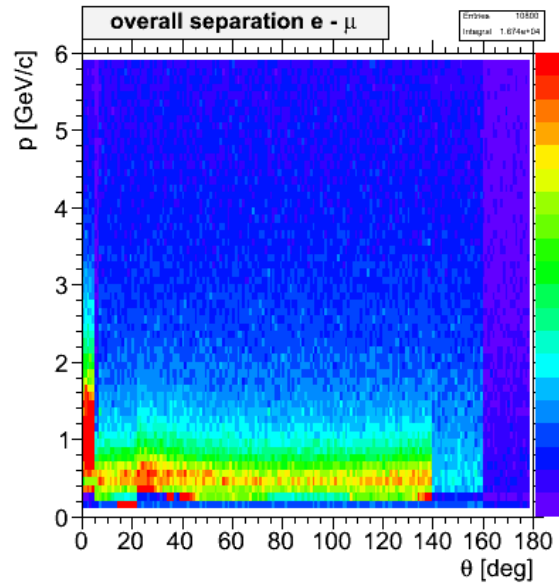


Trapping fraction disc (K,p)

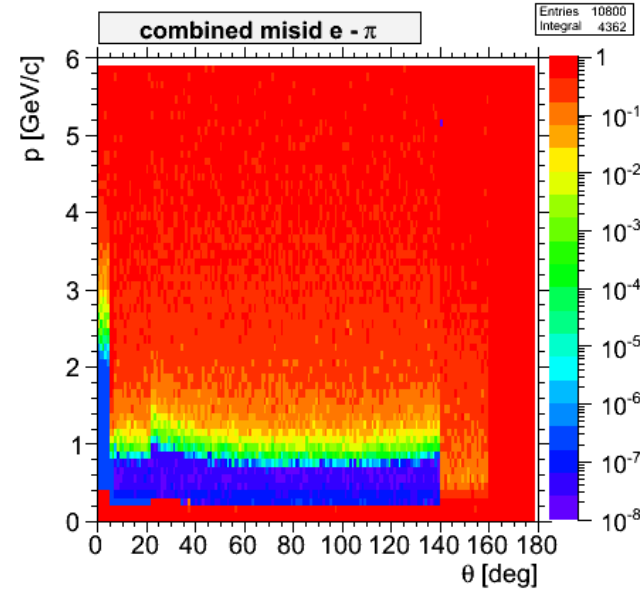
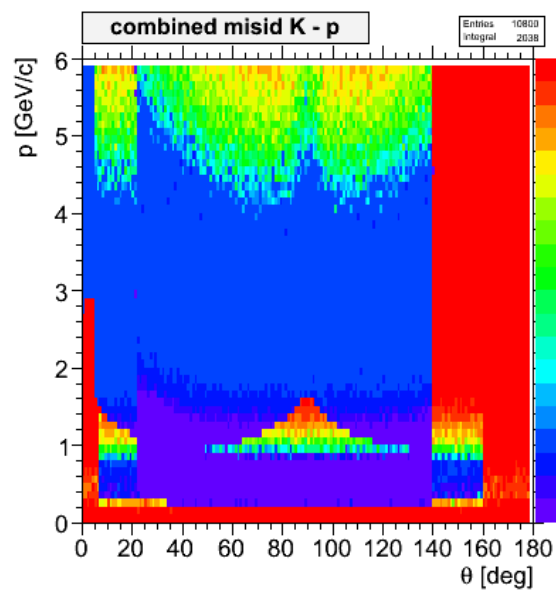
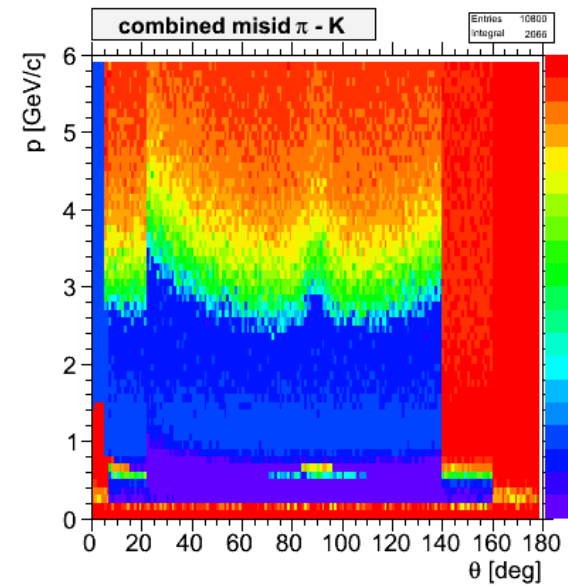
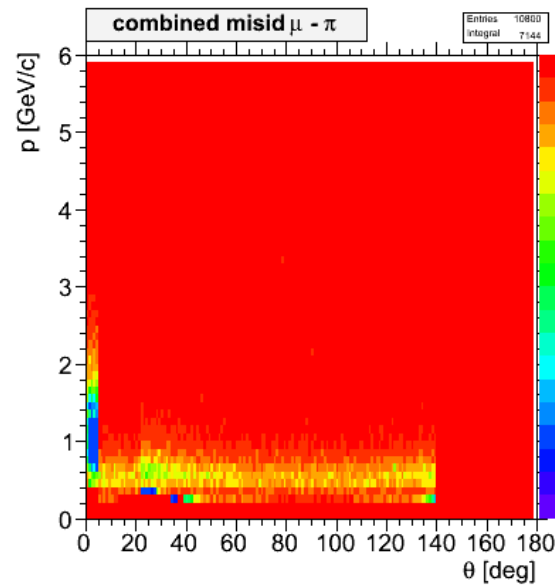
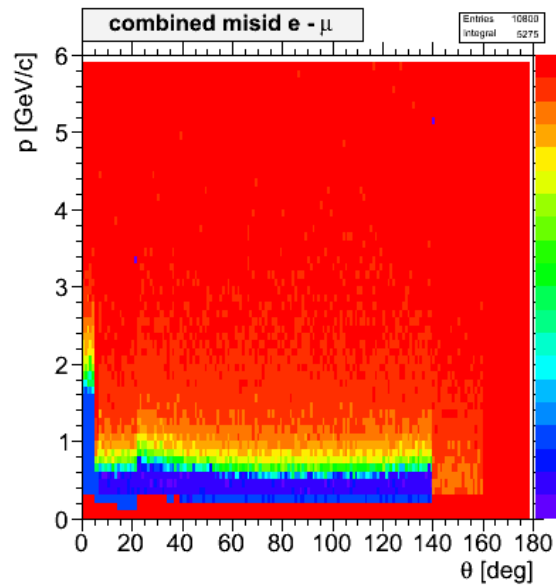


- To illustrate influence of mass and magnetic field strength, I produced [some animated gifs](#)
- Take a look to the wiki:
<http://panda-wiki.gsi.de/cgi-bin/view/Tagpid/DircTrappingFraction>

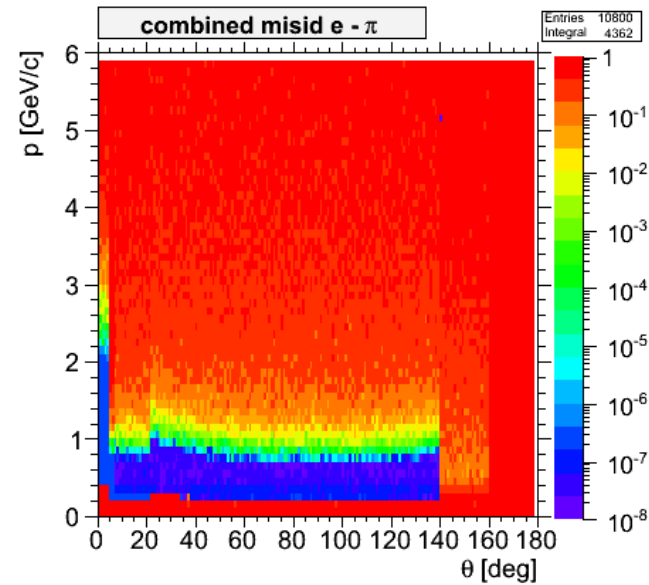
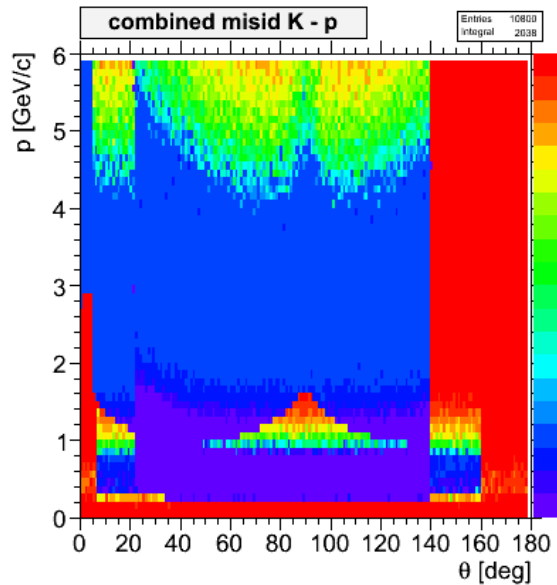
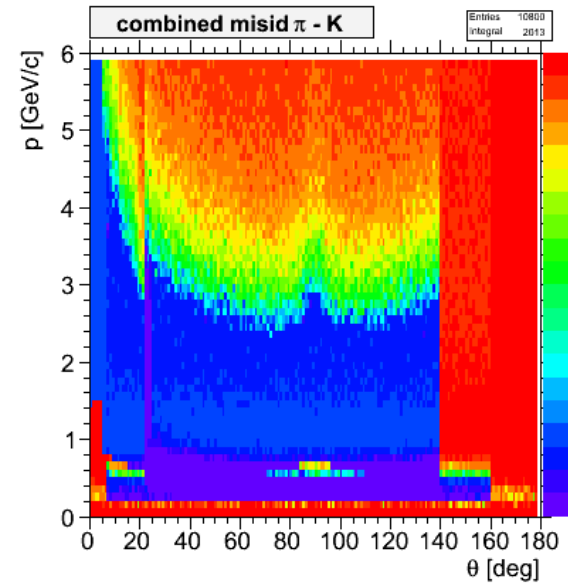
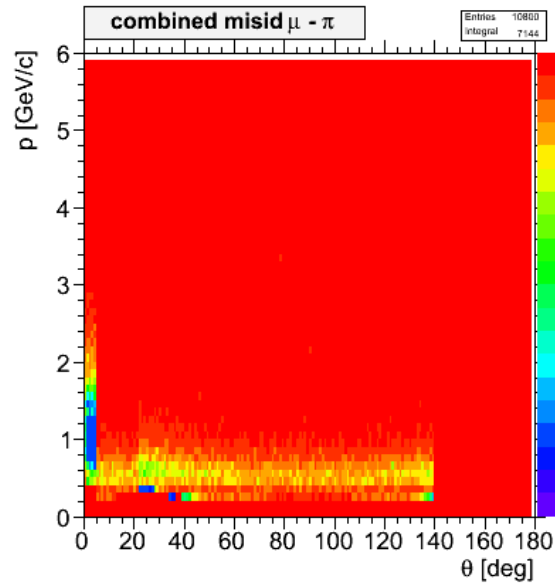
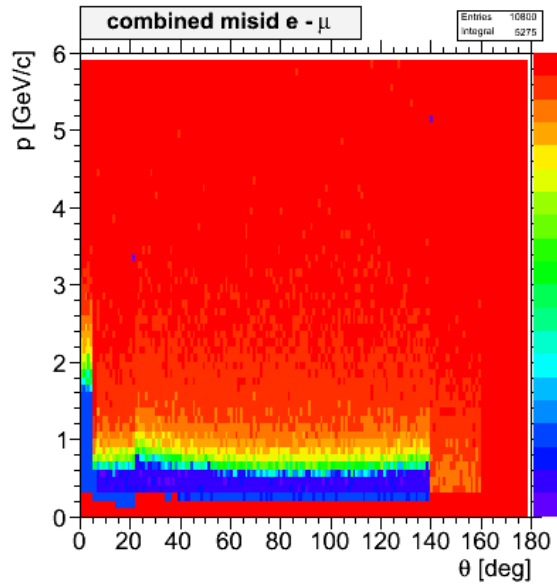




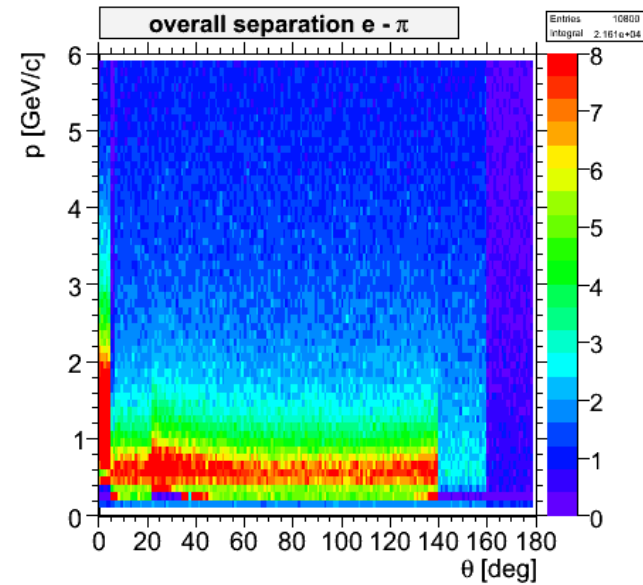
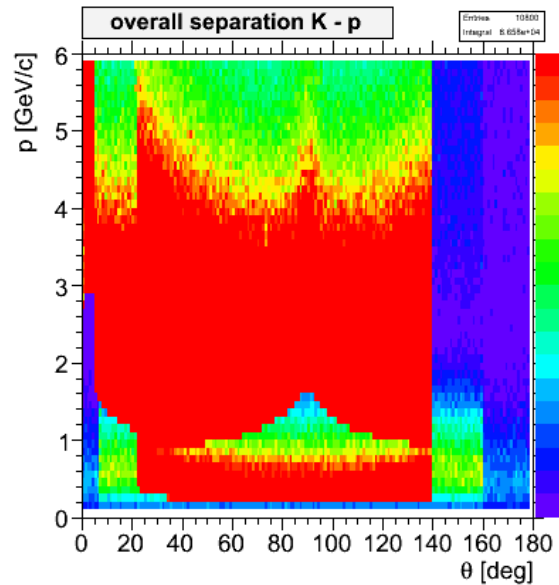
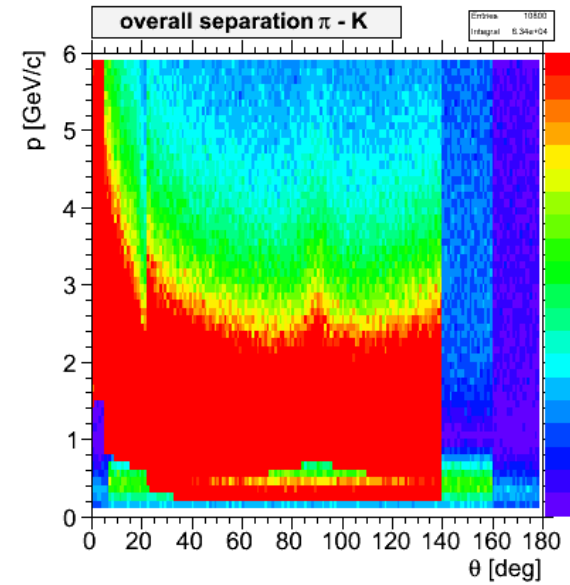
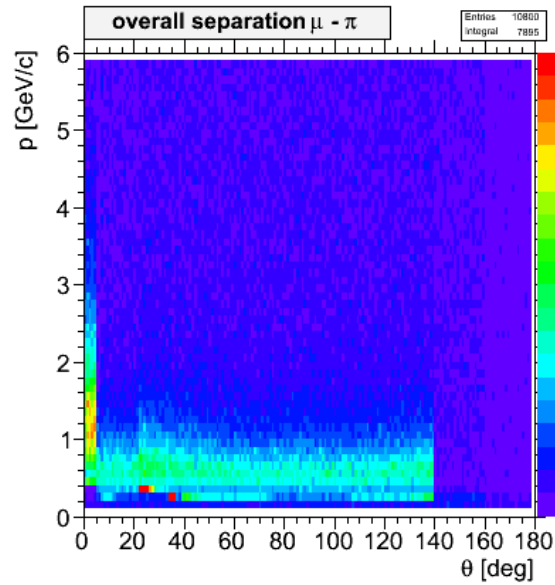
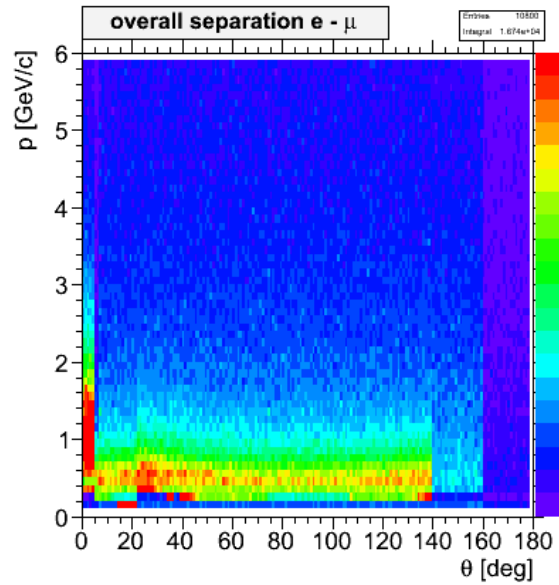
Mis Id logarithmic down to 10^{-8}



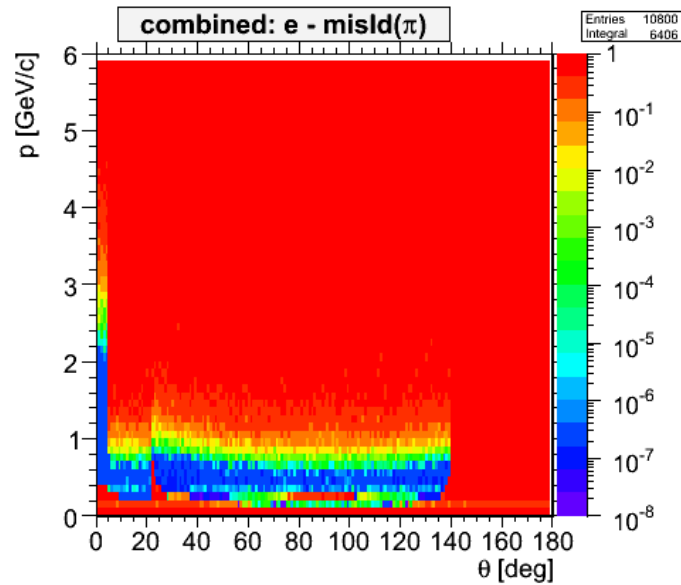
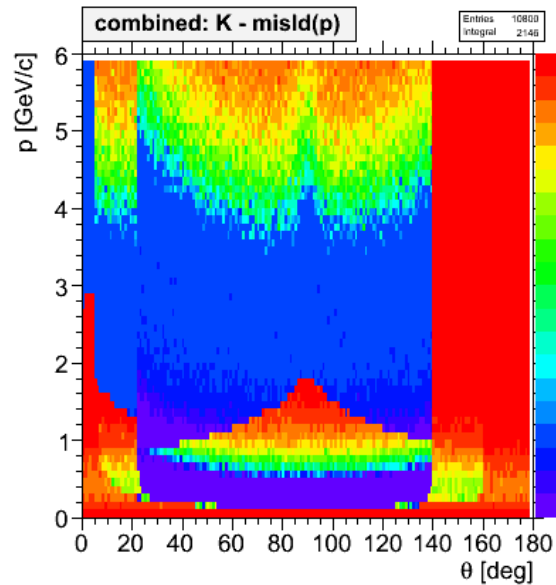
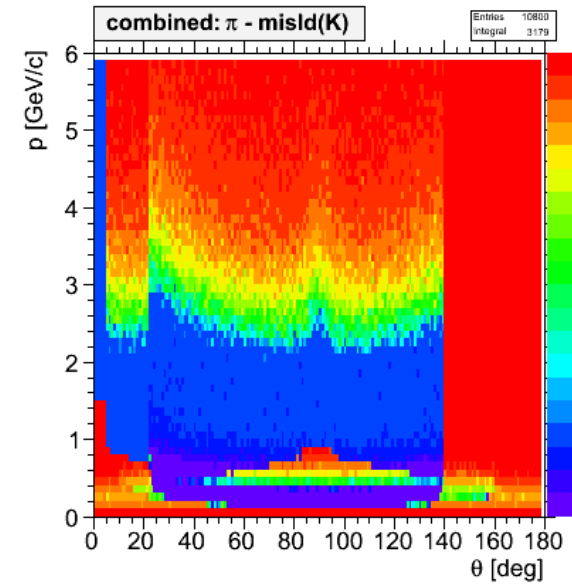
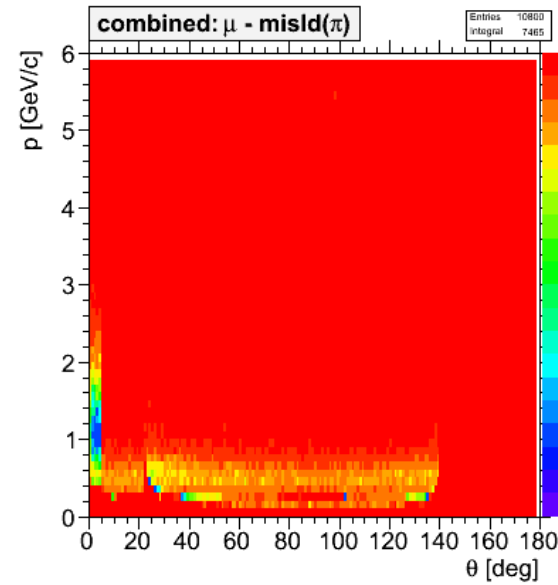
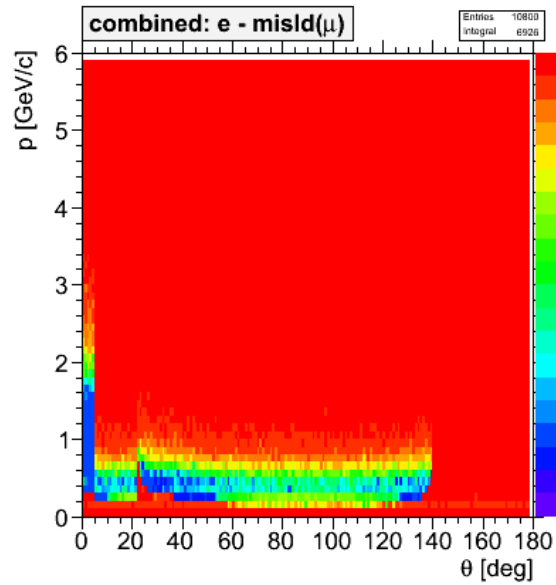
Mis Id logarithmic (K. Foehls Disc)



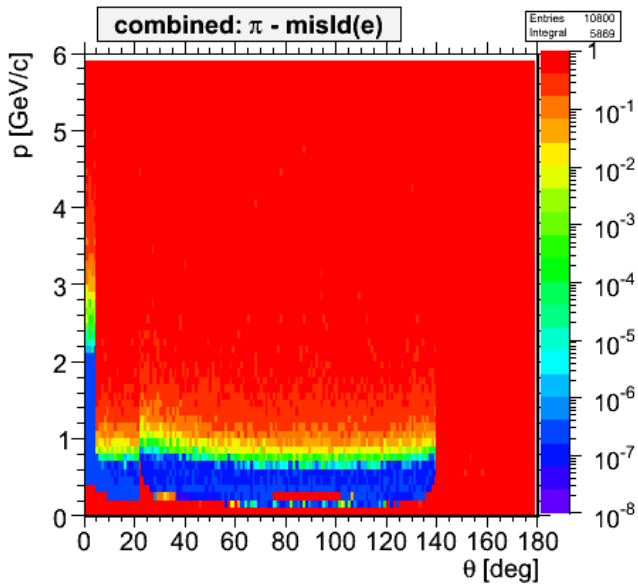
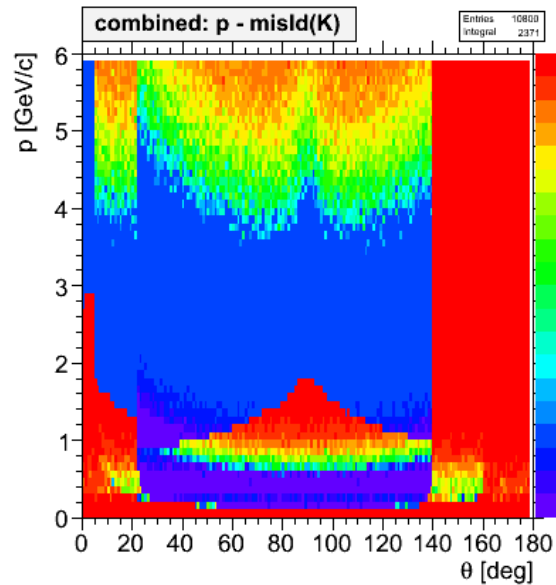
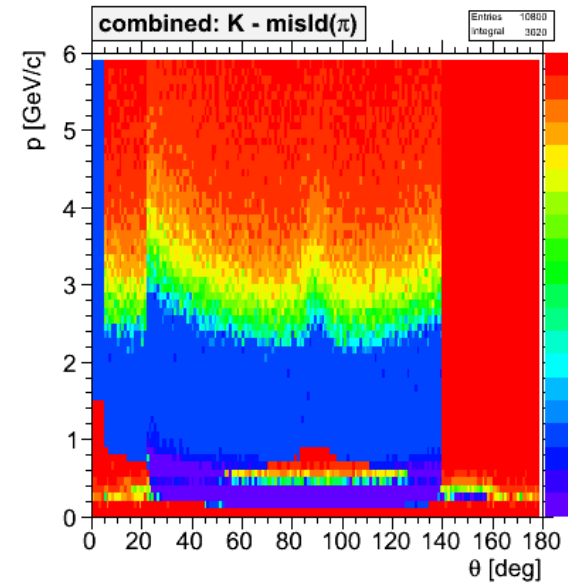
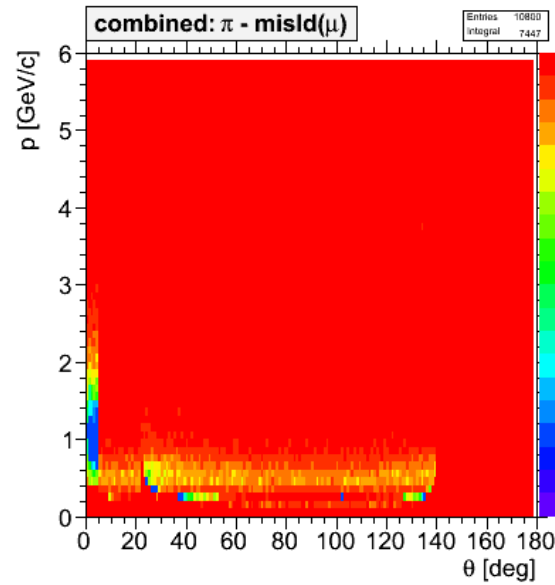
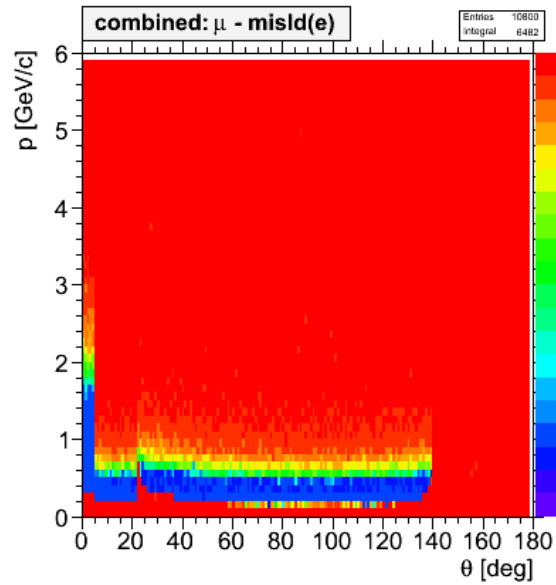
Separation (K. Foehls Disc)



mis id level (light vs heavy)



mis id level (heavy vs light)



- Due to positive identification requirement **more holes** in the map appear
- Need to take a look to **phase space** distributions of **more benchmark channels**
 - find out which fall in the holes
- Separation power is visually **equivalent to log mis id**
 - most likely because gaussian tails behave like exponentials
- **EMC information still missing**
(hope I can take a look soon to put it to this maps)