

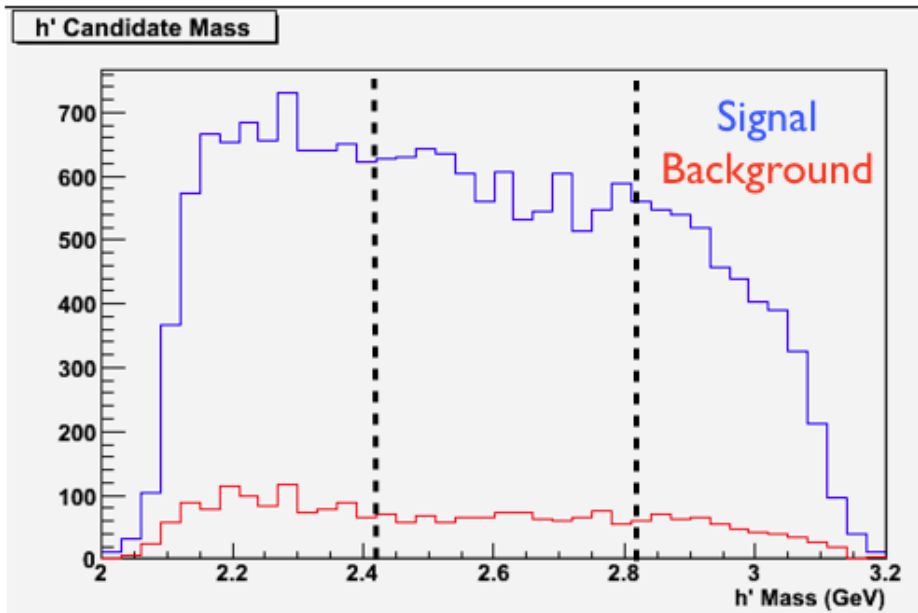
Removing Flipped Pi-K after the BDT

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h' (2600) w/ CKOV



BDT Cut and $\pm 1.5 \Gamma$ cut on K_1, K^* and h' masses

Remaining background:

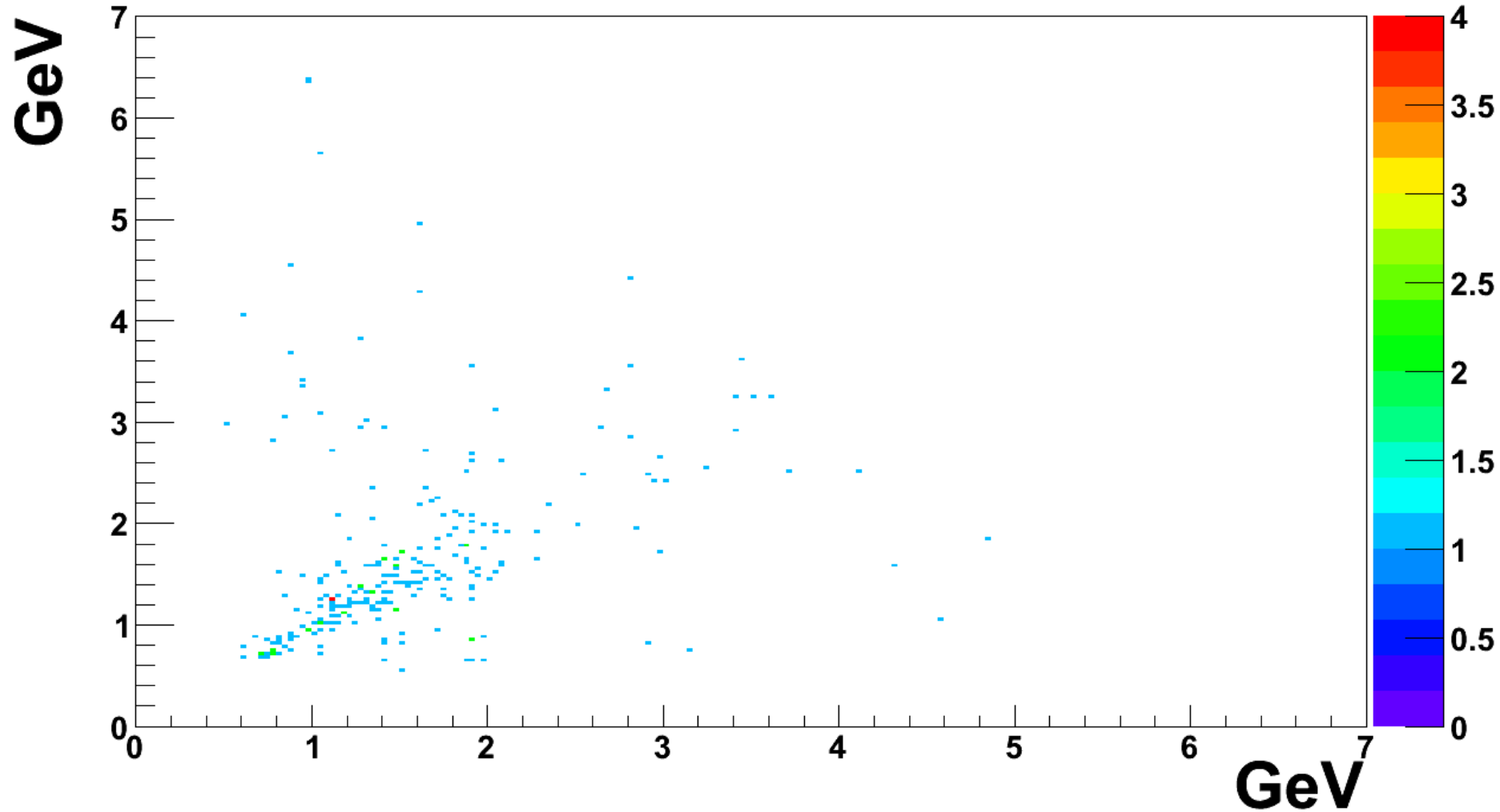
- 5% True PID but not exclusive
- 10% Correct topology but $\text{Proton} \leftrightarrow K^+$
- 50% Correct topology but $\pi^+ \leftrightarrow K^+$
- 15% Correct topology but $\pi^- \leftrightarrow K^-$

Analysis	Selection Efficiency	Purity
Cuts (w/o CKOV)	0.06	0.90
BDT (w/o CKOV)	0.29	0.90
BDT (w/ CKOV)	0.38	0.90

Method

- Focused on hprime2600 and misID of Pion for Kaon.
- Occurred when momentum of 2 particles was very close together
 - $E = \sqrt{p^2 + m^2}$, so similar p's produce similar E's and kinematics doesn't constrain PID very well.
- Plot of flipped particle momentum (for 8 and 11)

Pi Momentum vs K Momentum when Flipped



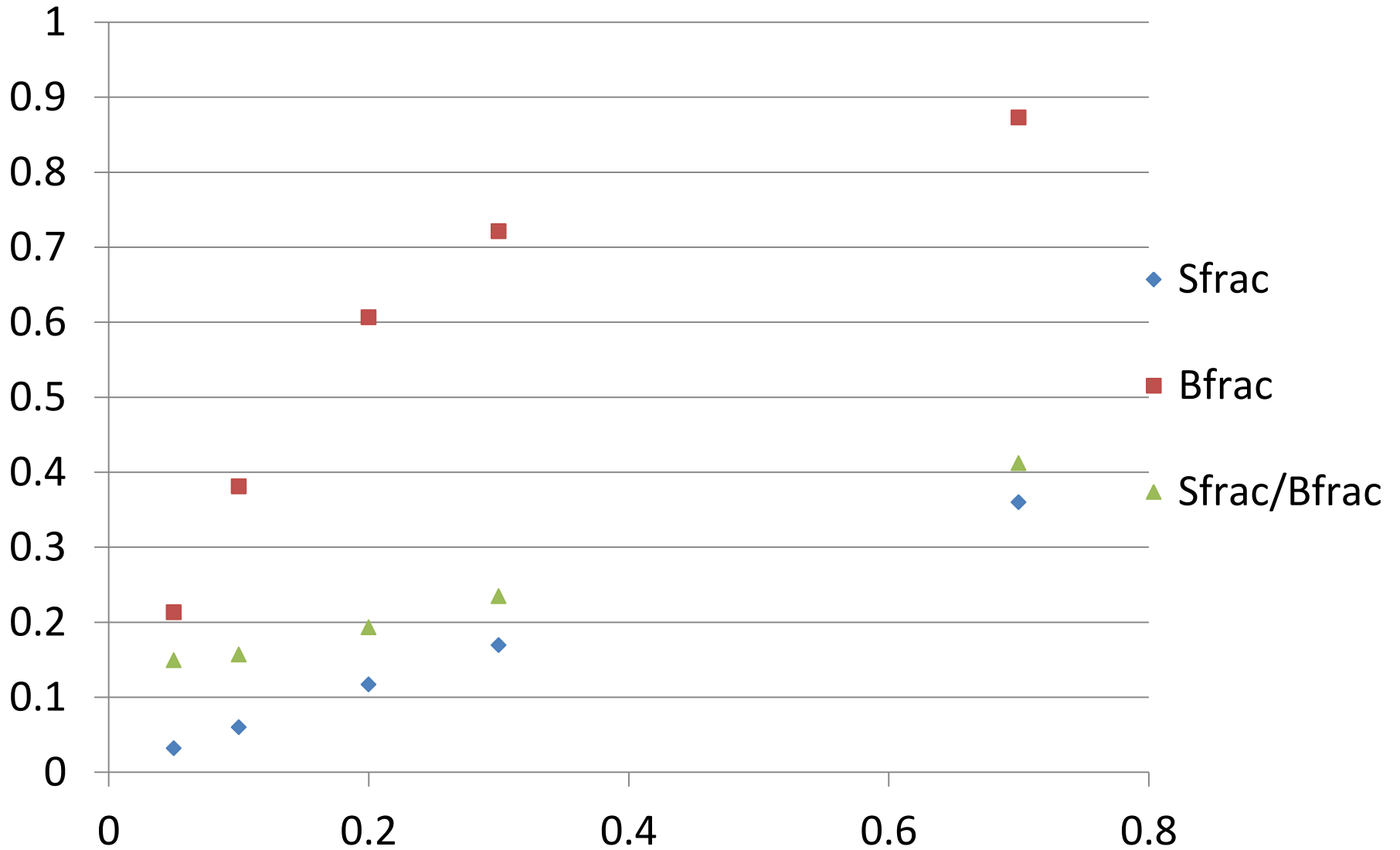
Try cutting on close momentum

- After Justin's cuts from the BDT, and true mass, see how much of the signal is cut.
- Then see how many flipped particles are cut.
- Assume deviation behaves roughly linearly and cut on:

$$(p_1 - p_3)^2 < d * (p_1 + p_3)^2$$

- Then vary d and examine effect.
 - Look at sample plot as well

Rejected versus d



Momentum Asymmetry in BDT

- 50% background from $K^+ \leftrightarrow \pi^+$
- Compute momentum asymmetry
- Include in BDT selection

$$\frac{p_\pi - p_K}{p_\pi + p_K}$$



Analysis	Selection Efficiency	Purity
BDT (w/o CKOV)	0.29	0.90
Mom Asym (w/o CKOV)	0.31	0.90
BDT (w/ CKOV)	0.38	0.90
Mom Asym (w/ CKOV)	0.41	0.90
BDT (w/o CKOV)	0.12	0.95
Mom Asym (w/o CKOV)	0.14	0.95
BDT (w/ CKOV)	0.21	0.95
Mom Asym (w/ CKOV)	0.27	0.95