Kaon Analysis Update

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Run configurations for 2015 Lariat Runs

Start Run	End Run	MC7AN	MC7ANB	Polarity
3828	3879	50		Positive
3880	3889	100		Positive
3891	4308	100		Negative
4309	4117	100		Positive
4118	4237	40		Positive
4255	4775	100	340	Positive
4795	4815	40	-25	Positive
4816		100	312	Positive
4817		80	181	Positive
4818		60	48	Positive
4901	5227	100	320	Positive
5228	5246	50	0	Positive
5247	5802	100	330	Positive
5803	5871	60	35	Positive
5880	5990	100	300	Positive
5991	6081	100	-260	Negative
6082	6140	60	-20	Negative
6141	6257	100	-250	Negative
6259	6283	100	300	Positive
6284	6329	100	-260	Negative
6330	6349	40	-45	Positive
6350	6359	20	-60	Positive
6360	6376	40	50	Negative
6377	6380	100	-250	Negative

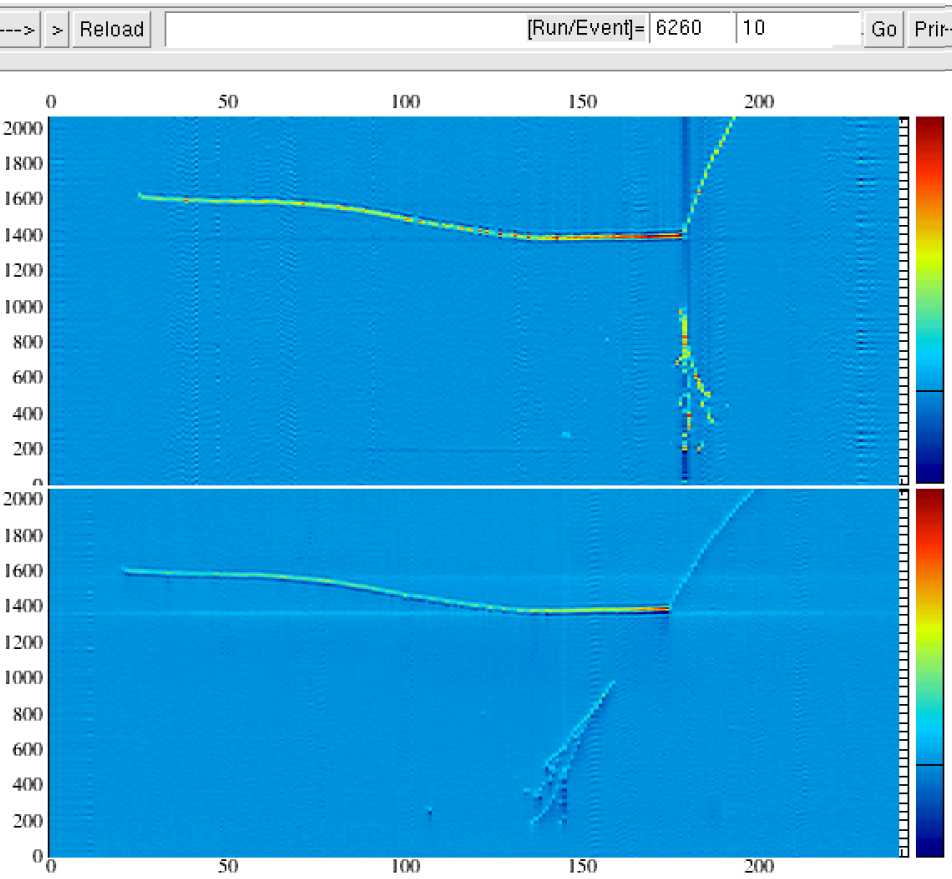
Courtesy of Randy Johnson

Expand K+ Dataset

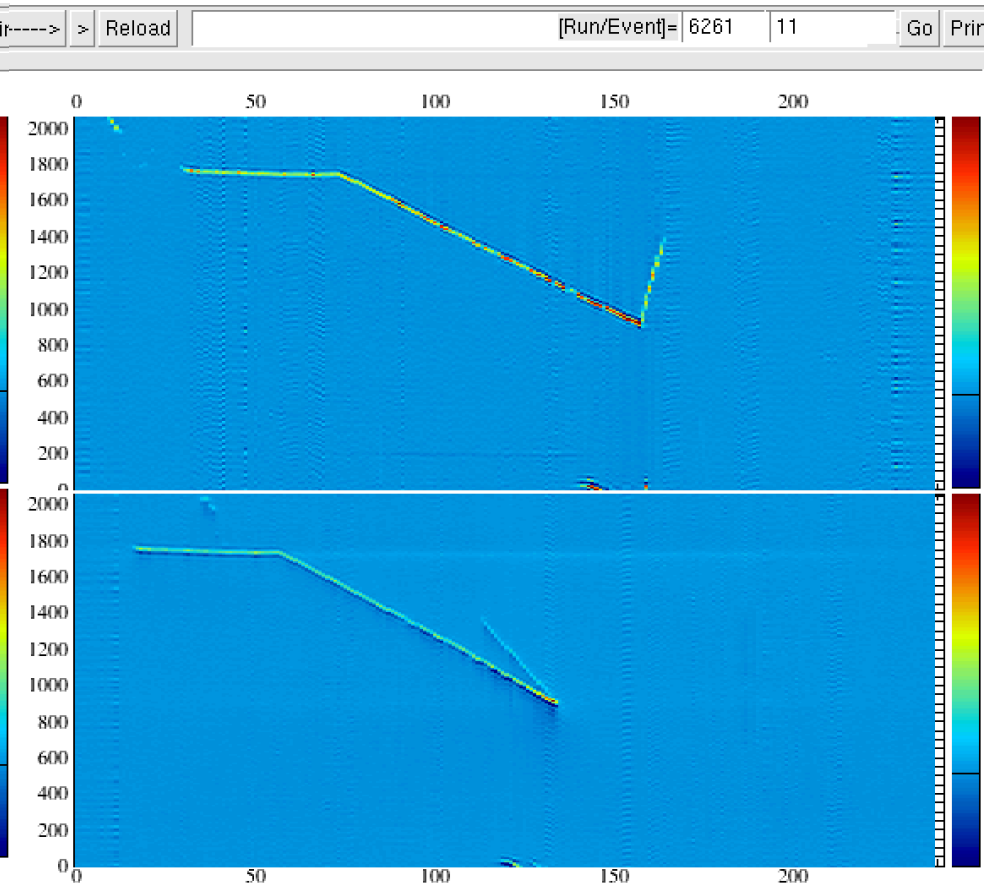
- TPC data begins on run 5229
- K+ requires positive polarity of bending magnets of tertiary beam
- Added runs 5600-5800 and 6360-6376 to data set with mixed results.
- Will add runs 5229-5600 in coming weeks, using sliced files made available by Jason
- Sliced runs located at /lariat/data/users/dsmith/kaon/sliced_files/

Visual Scan of Events

Many decaying events which are obvious kaons. Concerning number of contamination events.

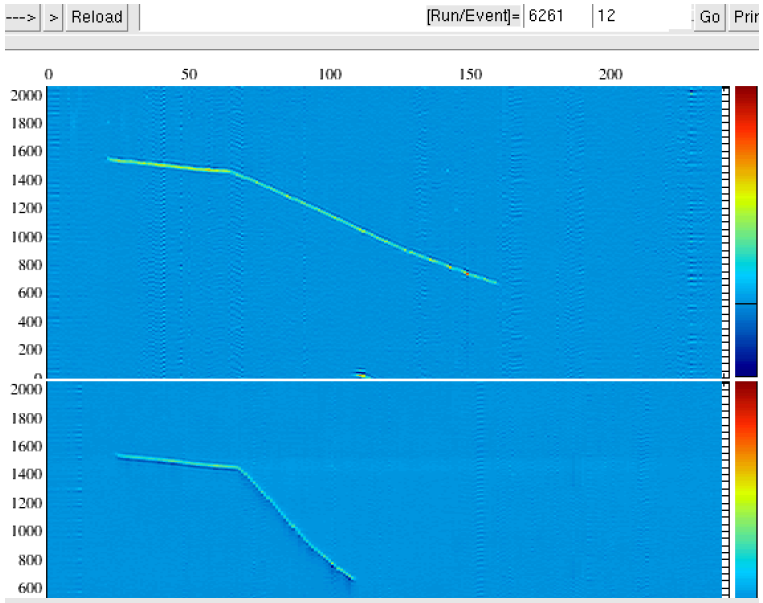


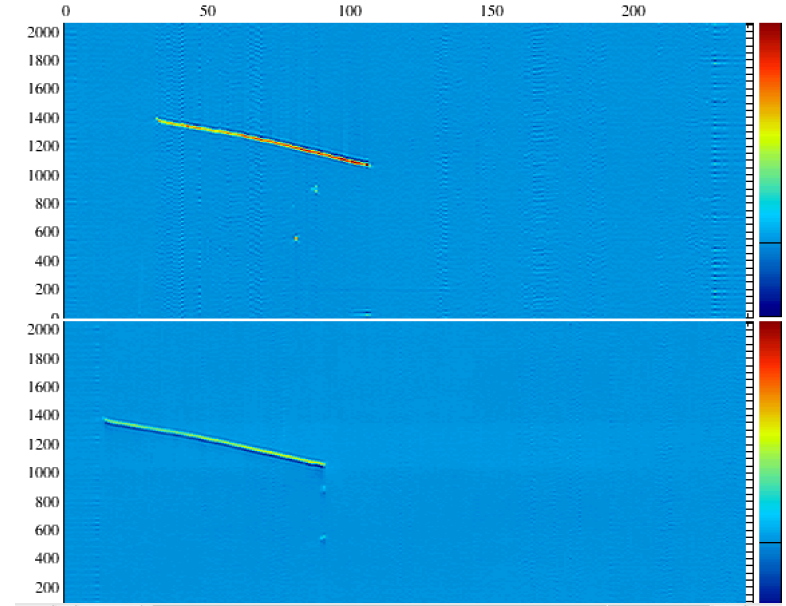
$$K^+ \rightarrow \pi^+ + \pi^0$$

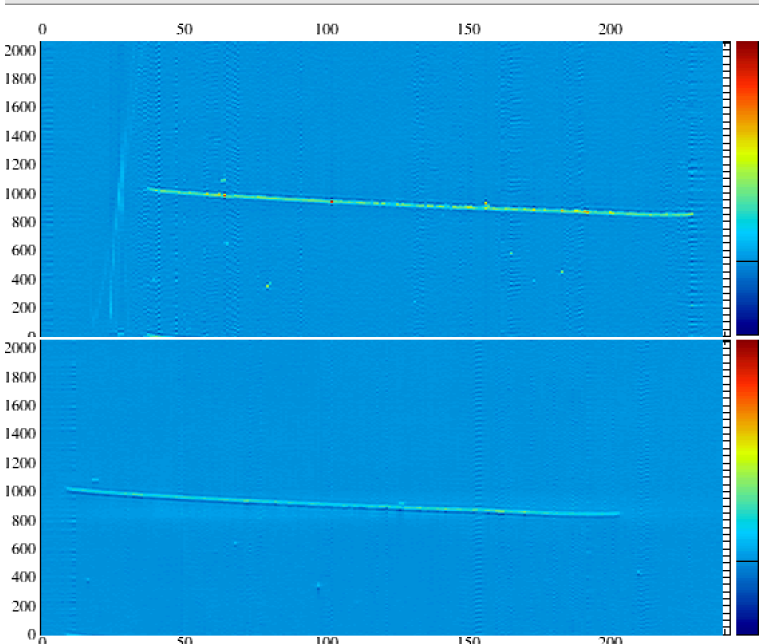


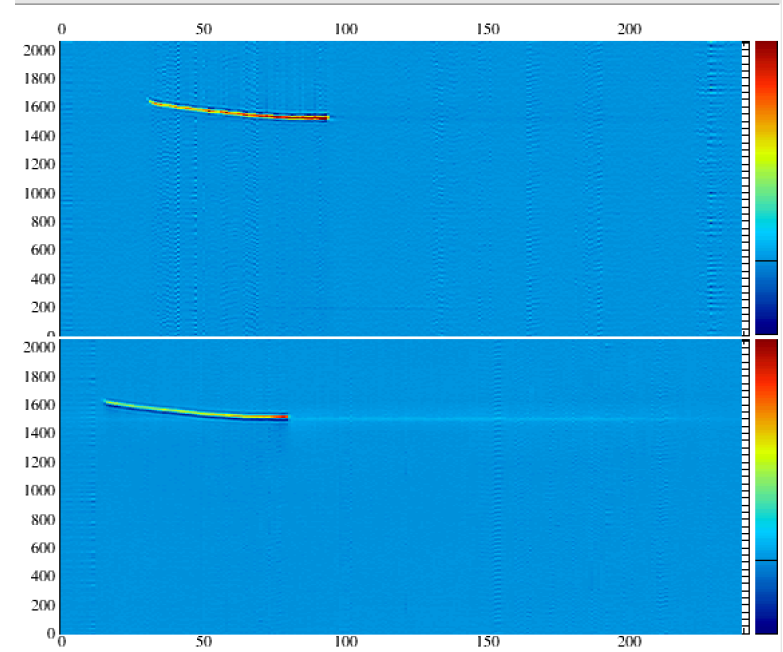
$$K^+ \rightarrow \mu^+ + \upsilon_\mu$$

Miss Tagged Events



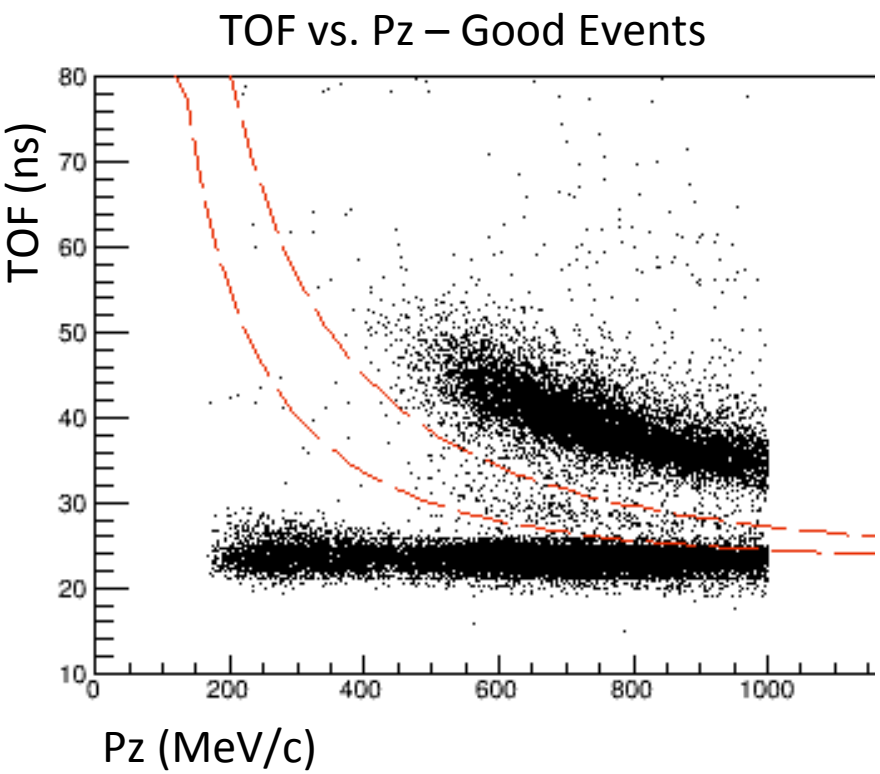


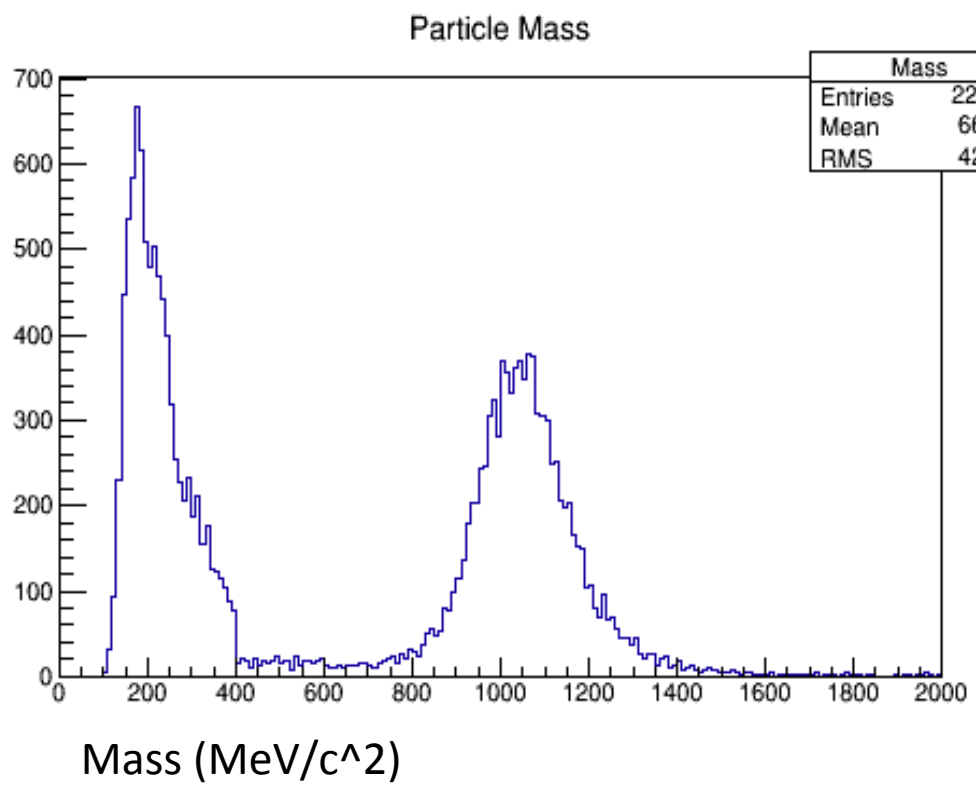




Updated Cuts

- Triangle phase space cut leaves uneven contamination
- Cut on momentum (x < 1.0 GeV) and cut on mass (400 < x < 700 MeV/c^2) is a more traditional approach to beamline ID
- From a quick visual inspection, Does improve contamination





Future Work

- Use new XS Analysis modules being developed by the Pion group
- Expand dataset using the soon to be sliced data
- Beamline studies to determine best run configuration for kaon study
- MC studies to better understand current XS results