

# Preliminary LiH Analysis

Ryan Bayes

March 21, 2016

# Summary of Data Collected

Run	TOF1	TOF2	Optics
7726	157245	50069	3-200+M0
7727	113646	50064	3-240+M0
7728	155686	50069	3-172+M0_WDS
7729	158469	50486	3-200+M0
7733	118038	51822	3-240+M0
7734	155869	50657	3-172+M0_WDS
7735	21982	6909	3-200+M0
7736	128748	40685	3-200+M0
7737	42409	18684	3-240+M0
7738	75044	32432	3-240+M0
7739	155796	50202	3-172+M0_WDS
7740	158122	50169	3-200+M0
7741	70361	30090	3-240+M0
7764	33188	9254	3-172+M0_WDS
7766	135272	38697	3-172+M0_WDS
7767	135043	38778	3-172+M0_WDS
7768	177677	50872	3-172+M0_WDS
7770	20239	5703	3-200+M0
7771	22888	6628	3-200+M0
7772	103154	29447	3-200+M0
7773	31908	9352	3-200+M0
7775	73564	29190	3-240+M0
7776	62218	24530	3-240+M0
7777	134381	38561	3-172+M0_WDS
7778	136389	38921	3-200+M0
7782	124121	36235	3-172+M0_WDS

Run	TOF1	TOF2	Optics
7783	84512	24754	3-172+M0_WDS
7786	12205	3564	3-172+M0_WDS
7787	34260	10086	3-172+M0_WDS
7788	125595	36116	3-200+M0
7789	127017	37166	3-200+M0
7790	81587	32096	3-240+M0
7794	58685	23493	3-240+M0
7795	23116	9071	3-240+M0
7796	78707	31167	3-240+M0
7797	119517	34462	3-200+M0
7798	127860	37059	3-200+M0
7799	97674	28456	3-172+M0_WDS
7800	99871	29377	3-172+M0_WDS
7804	144346	41182	3-200+M0
7805	106512	41801	3-240+M0
7806	140684	40551	3-172+M0_WDS
7807	51673	14871	3-200+M0
7808	4534	1844	3-240+M0
7809	18689	7509	3-240+M0
7813	84694	32852	3-240+M0
7814	88458	35041	3-240+M0
7815	50544	19814	3-240+M0
7816	38980	15299	3-240+M0
7817	32077	13009	3-240+M0
7818	72322	28480	3-240+M0
7819	32676	12901	3-240+M0

► Only physics runs listed

## Simple Event selection criteria for existing data

Selection	Description
TOF2 trigger	At least two raw TOF slab hits exist and at least one in each TOF plane.
TOF timing selection	Select muons from run: $TOF0 \rightarrow 1 \in \{27, 28.5\}$ ns for 240 MeV/c pion beams; $TOF0 \rightarrow 1 \in \{27, 42\}$ ns for muon beams.
Upstream, Downstream matching.	There is a track in both the upstream and downstream tracker.
Fiducial selection	$\sqrt{x^2 + y^2} < 300$ mm, $\sqrt{x'^2 + y'^2} < 0.035$

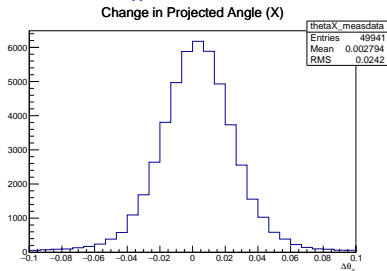
# Number of Good Events Identified in LiH and Data Rates

	172 MeV/c	200 MeV/c	240 MeV/c
raw TOF2	1676239	1793787	1326861
raw TOF2	500113	534916	541189
anal. TOF1	1144551	1430652	901000
anal. TOF2	155745	211351	169201
Selected	55030	73142	52949
Collection Time	89664.56 s	91526.1 s	91526.1 s
Rate of Selected $\mu$	$0.61 \text{ s}^{-1}$	$0.80 \text{ s}^{-1}$	$0.48 \text{ s}^{-1}$
Time to Target	20.3 hrs	9.3 hrs	26.9 hrs

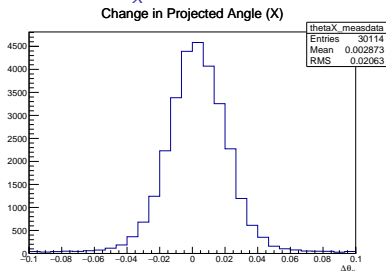
- ▶ Need 7 shifts to collect the requested data.
- ▶ We have  $\approx 10$  shifts.
- ▶ Anecdotally we have been running at 50% capacity.
- ▶ Priority should be on collecting 172 MeV/c data ( $\approx 2.5$  shifts) and 200 MeV/c data ( $\approx 1$  shift)

# Preliminary Scatter Distributions

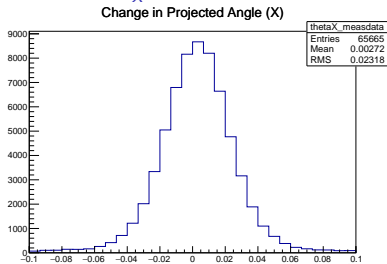
## 172 MeV $\theta_x$ distribution



## 240 MeV $\theta_x$ distribution



## 200 MeV $\theta_x$ distribution



- ▶ No treatment correcting for bias due to beam positioning has been applied
- ▶ Analysis done with a combination of MAUS v2.0.0 and v2.1.0
- ▶ Geometry has not been updated with new PID detector positions.

# Beam Distributions for 172 MeV/c Beam

