Trigger Study

- I have looked at a cross-section of the total sample. (~829 nb^{-1}).
- Runs: 141956 – 143336.
- DataSample: /JetMET/Run2010A-PromptReco-v4/RECO
- For these runs the prescales were different for different HLT Triggers.

Trigger path	Luminosity (nb^{-1})
HLT_L1Jet6U	0.2
HLT_Jet15U	5
HLT_Jet30U	97
HLT_Jet50U	829
HLT_Jet70U	829

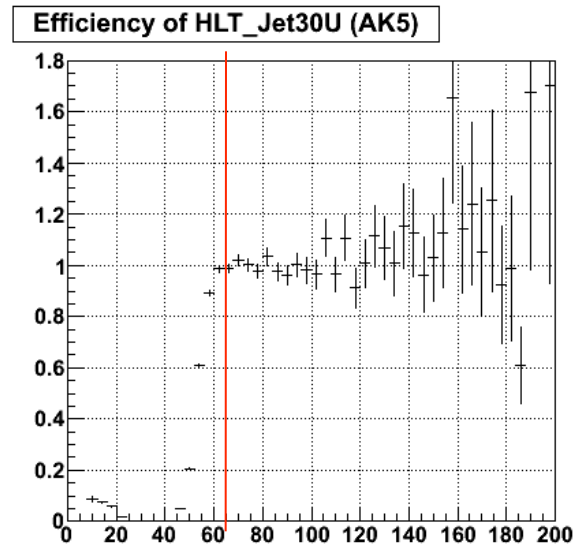
- The denominators of the following figures are, therefore, prescaled.

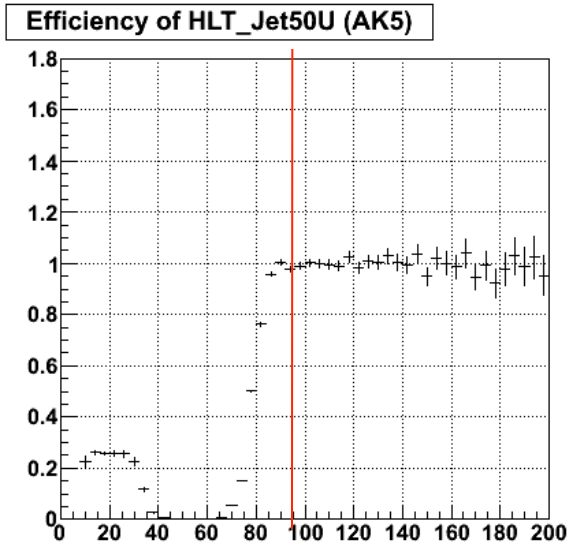
- Event selection:
  - Acceptance: y_boost <1.1, chi<16
  - p_T > 10 GeV. (for all); pT threshold has not been changed for different triggers paths.

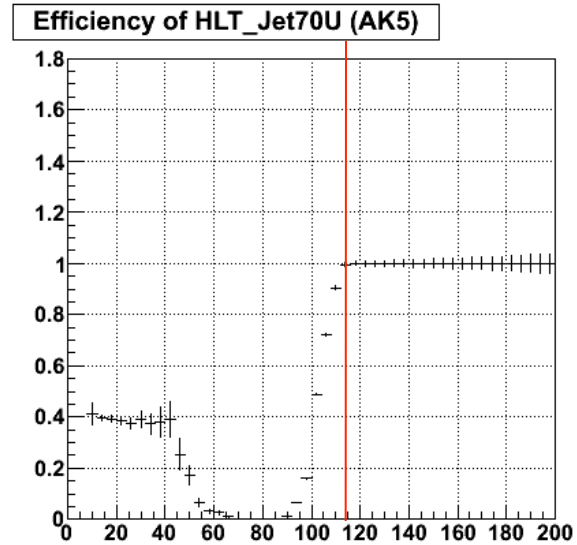
Efficiency as a function of Leading jet p_T (JEC-ed)

Difficult to find 15 efficiency based on these later (prescaled runs). We have to use the earlier runs and the old values of threshold (i.e. 210 GeV) for Jet15U.

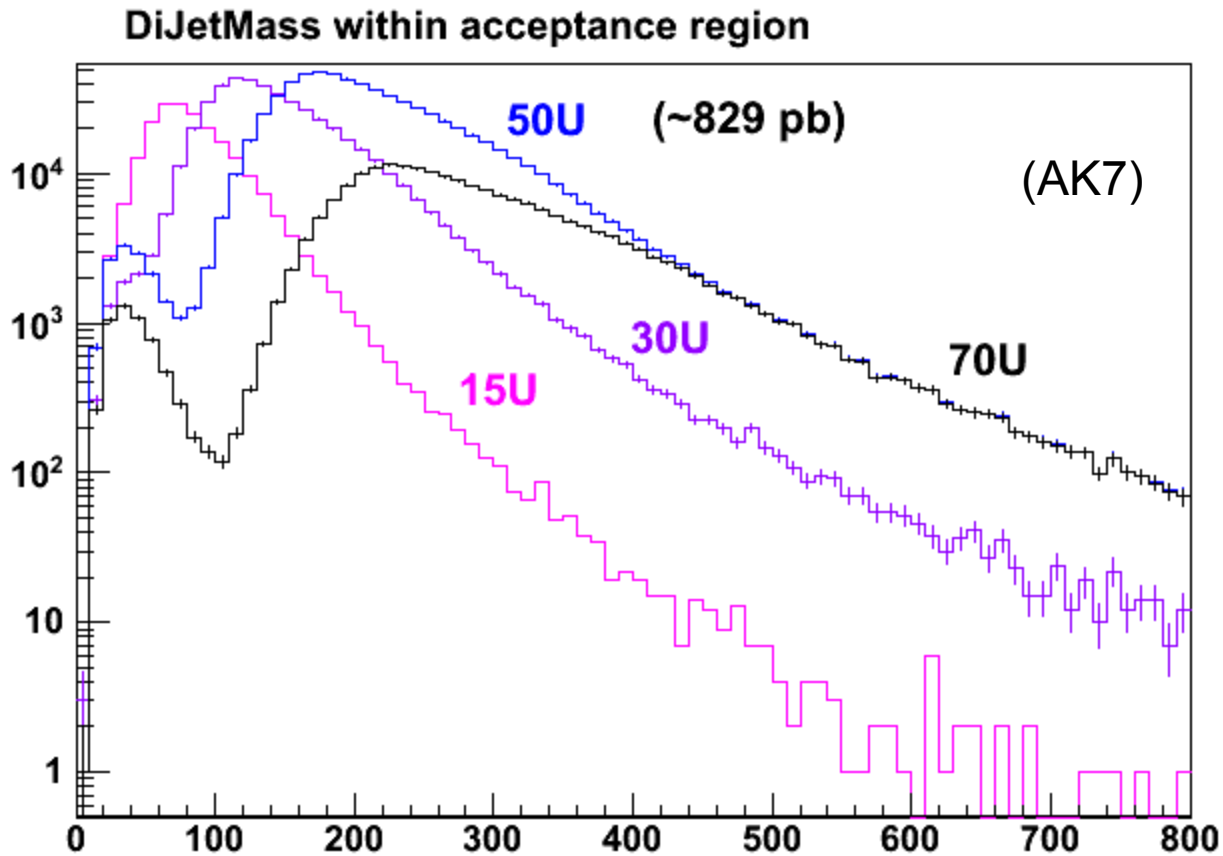
The image cannot be displayed. Your computer may not have enough memory to open the image, or the image may have been corrupted. Restart your computer, and then open the file again. If the red x still appears, you may have to delete the image and then insert it again.



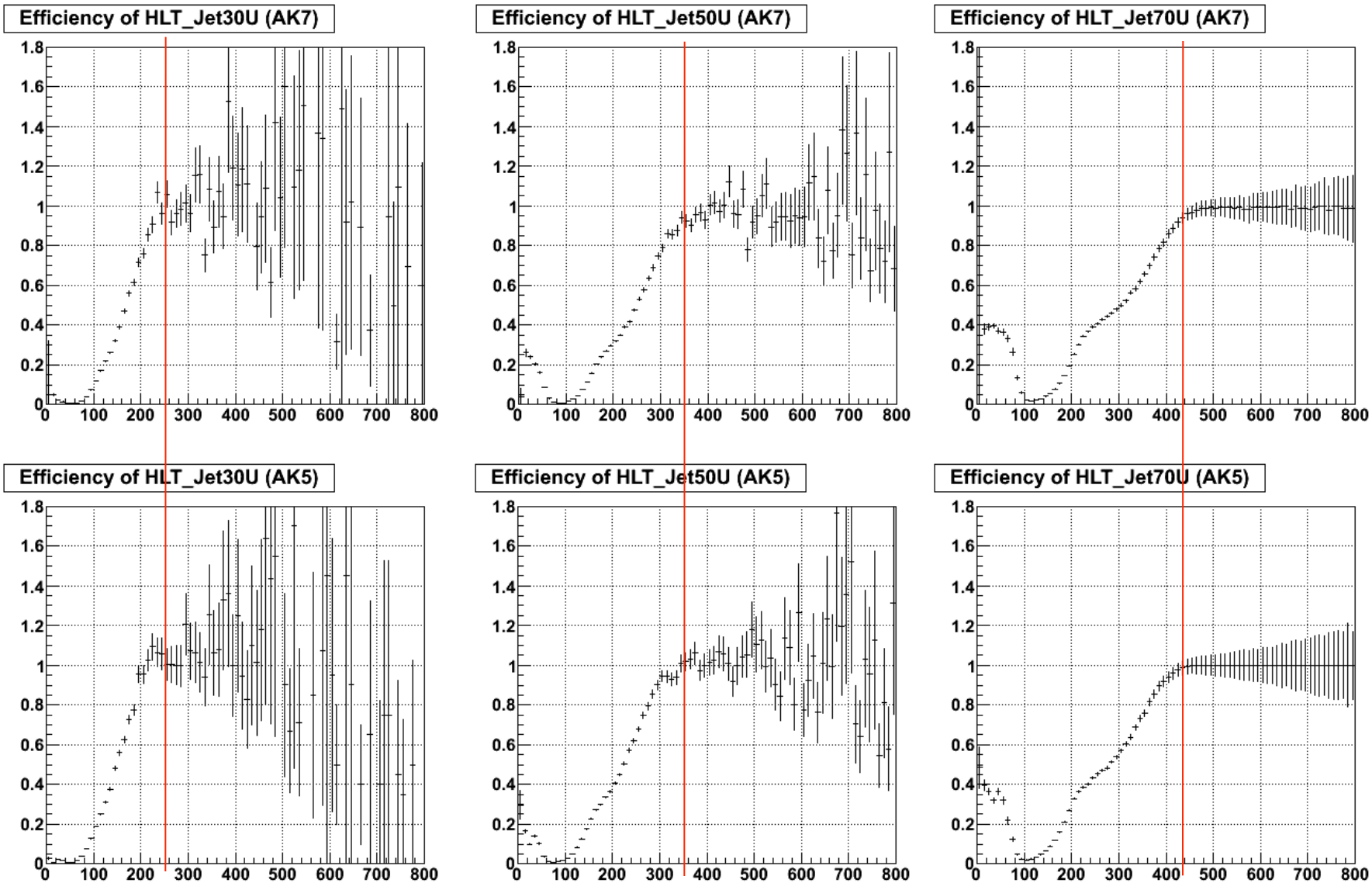




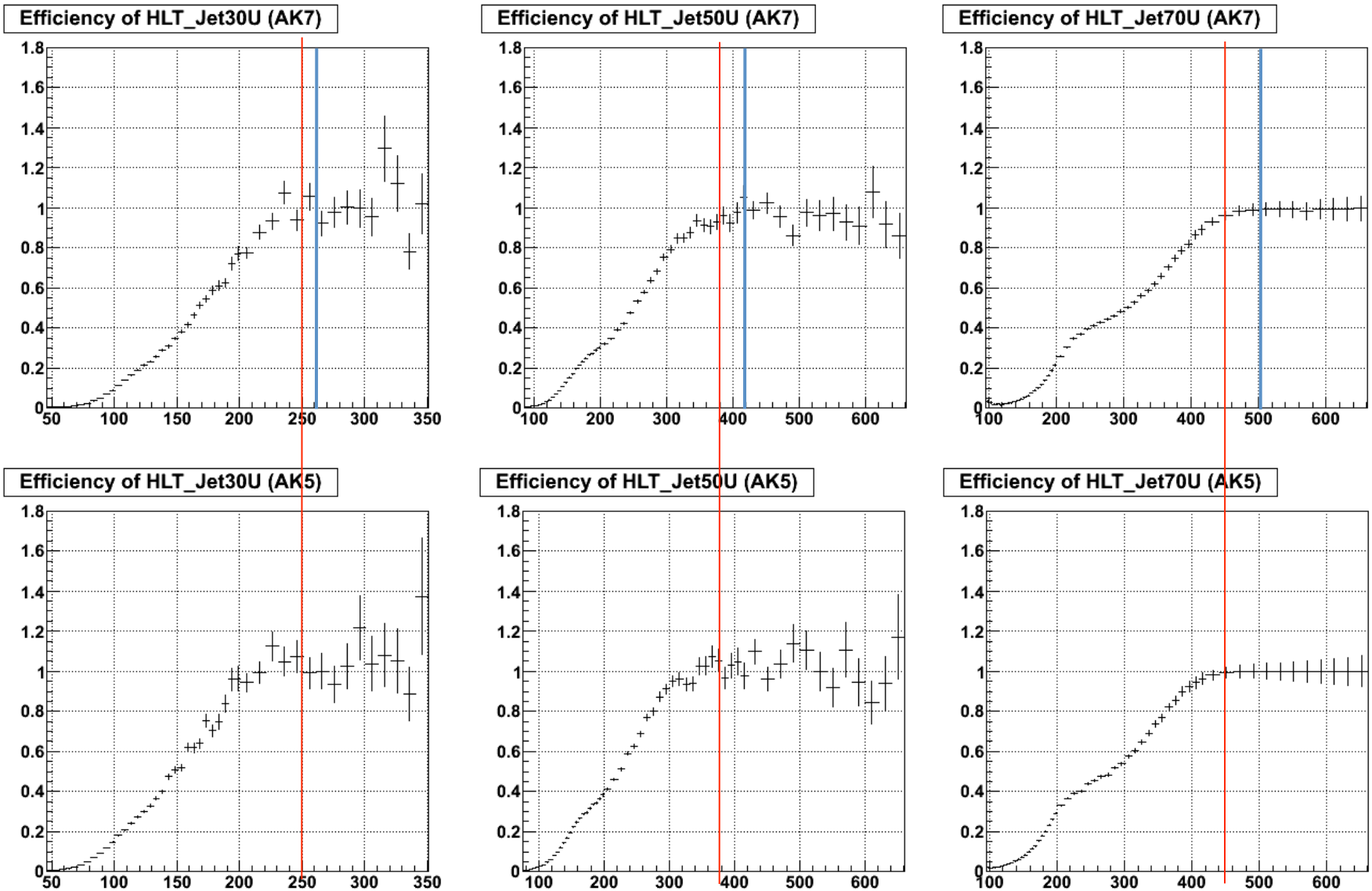
Dijet Invariant Mass Distributions



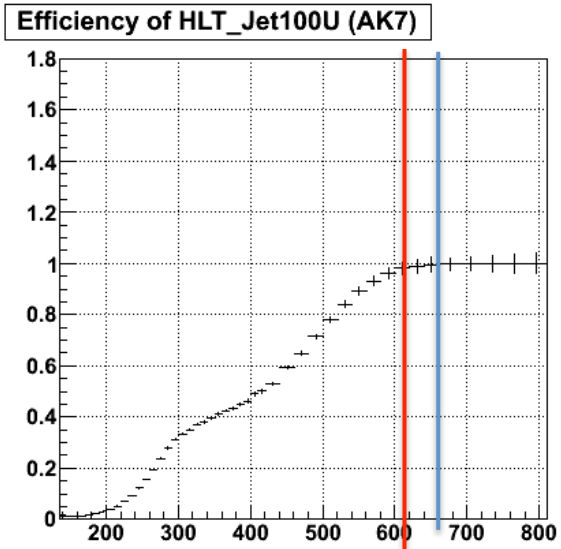
Efficiency as a function of Dijet Mass

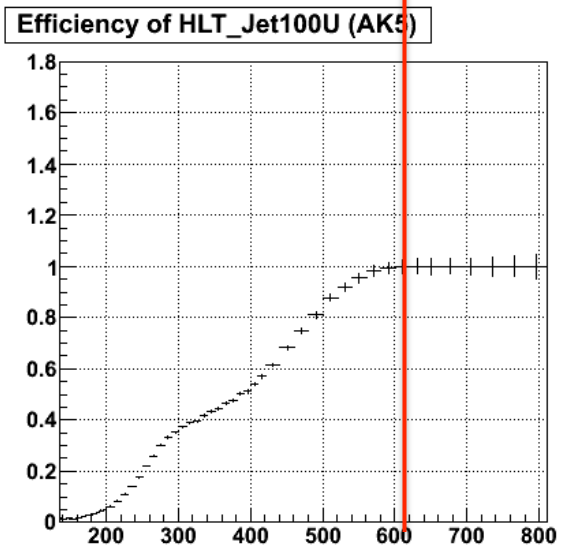


Efficiency as a function of Dijet Mass



For Jet100U


Efficiency of HLT_Jet100U (AK7)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
200
300
400
500
600
700
800


Efficiency of HLT_Jet100U (AK5)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
200
300
400
500
600
700
800

My Inferences

- As we can see – the turn on points for AK5 and AK7 are not the same.
- For AK7 the turn-ons are a bit higher.
- A rough mass bin suggested is as follows:

Mjj > xxx GeV	**AK5**	**AK7**
HLT_Jet15U	OLD	OLD *
HLT_Jet30U	**250**	**300**
HLT_Jet50U	**360**	**400**
HLT_Jet70U	**440**	**480**

<u>Question:</u> Should we even use Jet15U any more, and for that matter remove the first mass bin?

<u>Question:</u> Even for the Jet30U – should we use the unprescaled turn ons which existed in the AN, as with new data this is quite difficult to make a decision.

- I have to run on more runs which are currently going on ..

Updated turn-on's after rebinning

In slide 5 red lines show the AK5 turn-ons and where it would have been in AK7. The blue lines show the turn ons for AK7.

Mjj > xxx GeV	AK5	AK7
HLT_Jet15U	OLD	OLD *
HLT_Jet30U	**250**	**260**
HLT_Jet50U	**380**	**420**
HLT_Jet70U	**445**	**500**
HLT_Jet100U	**620**	**660**

Remaining issues

- HLT_Jet140U and HLT_Jet180U turn on's still remaining ..
- Jet180U – not possible till next JSON release.
- Issues with Jet100U – for example:
- It has different _v1, _v2 for later runs. Needs to produce turn on for each of them, and for physics analysis I guess we shall use the all those triggers as OR for the corresponding mass bin (eg. 600<M<800).

Delivered LS	Delivered (/ÎŒb)	Selected LS	Recorded (/ÎŒb)	Effective (/ÎŒb)	HLT_Jet100U
21117	24136123.287	17000	9118039.007	2975734.705	

Run	Delivered LS	Delivered (/ÎŒb)	Selected LS	Recorded (/ÎŒb)	Effective (/ÎŒb)	HLT_Jet100U
146428	109	10452.711	[1-2], [11-52], [55-92]	-215.831	-215.831	
146430	112	10337.355	[1-12], [18-47], [50-62], [65-90]	1271.010	1271.010	
146431	154	13677.686	[1-23]	363.135	363.135	
146436	542	42806.736	[1-152], [255-532]	26311.485	26311.485	
146437	823	54802.710	[1-817]	45117.897	45117.897	
146511	840	282728.565	[1-63], [65-778]	208668.100	208668.100	
146513	24	6869.292	[1-1], [3-15]	-867.545	-867.545	
146514	1045	250412.849	[1-545], [548-885]	176893.322	176893.322	
146644	2496	1155245.560	[96-117], [119-565], [567-874], [876-1032], [1034-2179], [2377-2473]	771398.852	771398.852	
146804	932	605712.078	[111-148], [150-520], [522-789], [791-822], [824-905]	311573.592	311573.592	
146807	510	304458.453	[132-362], [365-420], [422-469]	128223.657	128223.657	
146944	641	554106.825	[177-669]	295384.650	295384.650	
147043	458	259337.529	[161-500]	193416.983	193416.983	
147048	427	353785.488	[94-484]	222440.009	222440.009	
147114	680	554973.629	[180-187], [227-240], [247-667]	255191.392	255191.392	
147115	557	498861.841	[1-546]	348185.665	348185.665	
147116	39	31783.250	[1-54]	-7621.669	-7621.669	
147196	221	332591.973	[1-90]	71594.524	N/A	
147214	87	101817.776	[1-79]	36325.373	N/A	
147216	68	76751.937	[1-63]	36885.989	N/A	
147217	201	217936.467	[1-193]	163366.029	N/A	
147218	60	62699.856	[1-45]	27482.316	N/A	
147219	365	355950.310	[1-293], [309-320]	237791.506	N/A	
147222	550	450784.560	[1-444]	322379.307	N/A	
147284	292	437504.767	[32-306]	293275.406	N/A	
147390	875	1108475.051	[1-478], [480-839]	845717.989	N/A	
147450	184	245213.372	[80-166]	106080.257	N/A	
147451	540	944198.162	[1-116], [118-129]	110198.296	N/A	
147452	107	167605.932	[1-44]	39718.109	N/A	
147453	157	238242.764	[1-146]	166874.099	N/A	
147454	89	129245.424	[1-96]	90466.492	N/A	
147754	600	1071644.952	[1-167], [170-377]	476270.308	N/A	
147755	369	533960.477	[81-231]	184671.842	N/A	
147757	442	535299.219	[1-363]	368270.200	N/A	
147926	564	1016116.235	[77-548]	615816.491	N/A	
147927	171	294308.650	[1-152]	124430.674	N/A	
147929	619	896743.025	[1-266], [272-643]	724156.824	N/A	
148002	223	446522.864	[92-203]	118671.684	N/A	
148029	589	934585.962	[50-483], [485-569], [571-571]	693625.977	N/A	
148031	864	1139934.770	[1-341], [472-757], [759-855]	833055.035	N/A	
148032	217	235742.263	[1-199]	189546.510	N/A	
148058	78	251885.338	[1-97]	-294353.075	N/A	
148822	470	1181133.331	[1-446]	637365.772	N/A	
148860	46	213209.894	[1-39]	-1073592.262	N/A	
148862	952	3494244.067	[1-18], [20-108], [110-149], [151-165], [224-258],	-1175902.850	N/A	