

Calorimeter occupancy summary-updated

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Files used in the study

- Files used: root://dtn-eic.jlab.org//volatile/eic/EPIC/FULL/26.02.0/epic_craterlake/Bkg_Exact1S_2us/GoldCt/10um/DIS/NC/10x100/minQ2=1/
- Used 800 root files, NO events = 162400
 - Total NO background files available : 910
 - 88% total files used.
- Terminology:
 - Hottest-channel: Average rate of the hottest channel.
 - Max-ch: 100% highest number of hits in a single event.

By channels

ScFi occupancy

E-Threshold = 500 keV

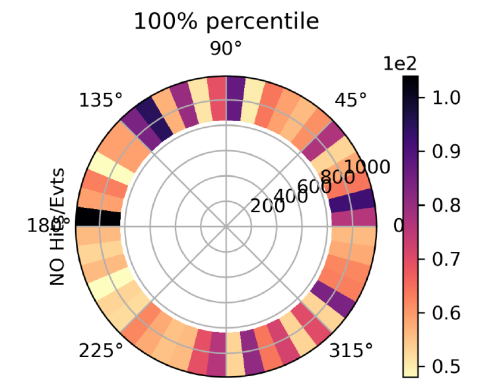
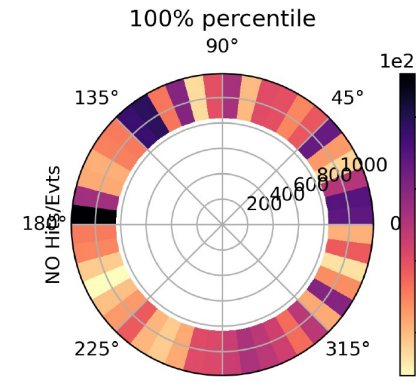
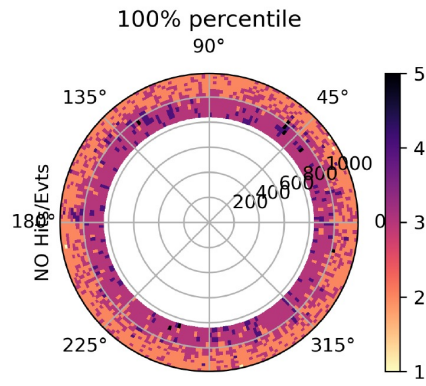
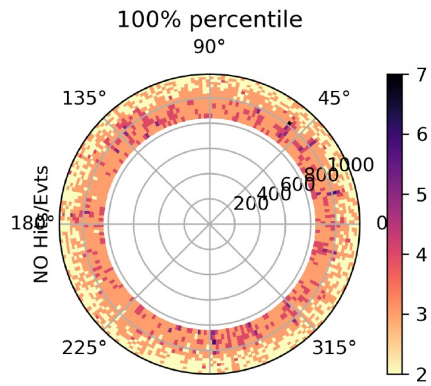
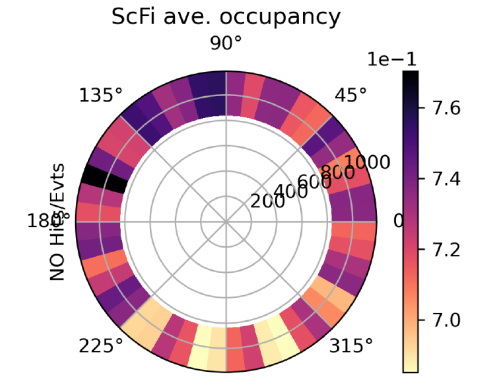
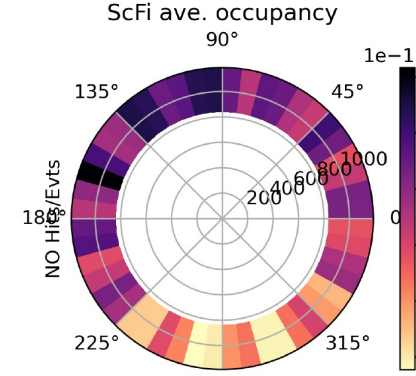
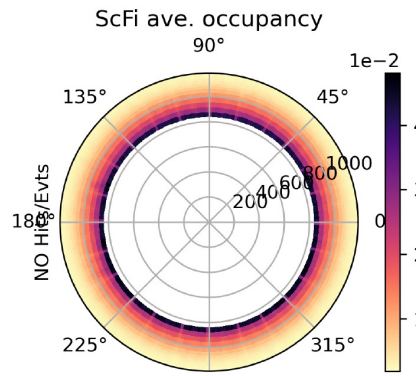
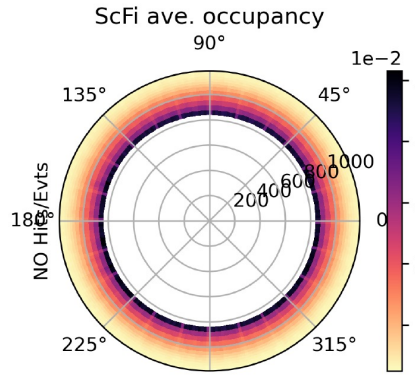
By sectors

+z side

-z side

+z side

-z side



(NO Hits/Evts)	ave-ch	max-ch
DIS:	0.011	7.000
e- beam bkg:	0.002	4.000
P beam bkg:	8.88e-05	3.000
Tot.:	0.014	7.000

(NO Hits/Evts)	ave-ch	max-ch
DIS:	0.010	5.000
e- beam bkg:	0.002	4.000
P beam bkg:	6.90e-05	3.000
Tot.:	0.012	5.000

(NO Hits/Evts)	ave-sect	max-sect
DIS:	0.682	132.000
e- beam bkg:	0.127	19.000
P beam bkg:	0.005	32.000
Tot.:	0.849	132.000

(NO Hits/Evts)	ave-sect	max-sect
DIS:	0.578	104.000
e- beam bkg:	0.111	20.000
P beam bkg:	0.004	31.000
Tot.:	0.725	104.000

(Tot Hz)	all-ch	hottest-ch
DIS:	1.64e+07	1.38e+04
e- beam bkg:	3.04e+06	9.82e+03
P beam bkg:	1.28e+05	1.62e+03
Tot.:	2.04e+07	2.58e+04

(Tot Hz)	all-ch	hottest-ch
DIS:	1.39e+07	1.19e+04
e- beam bkg:	2.66e+06	9.79e+03
P beam bkg:	9.93e+04	1.64e+03
Tot.:	1.74e+07	2.40e+04

(Tot Hz)	all-sect	hottest-sect
DIS:	1.64e+07	3.69e+05
e- beam bkg:	3.04e+06	7.35e+04
P beam bkg:	1.28e+05	1.42e+04
Tot.:	2.04e+07	4.52e+05

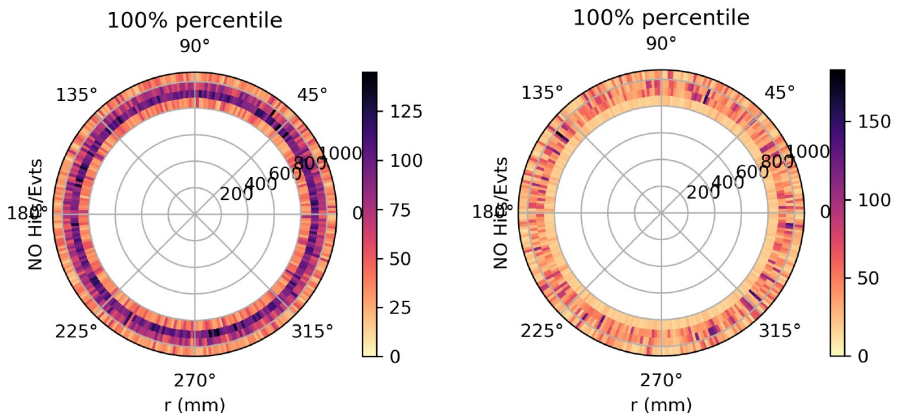
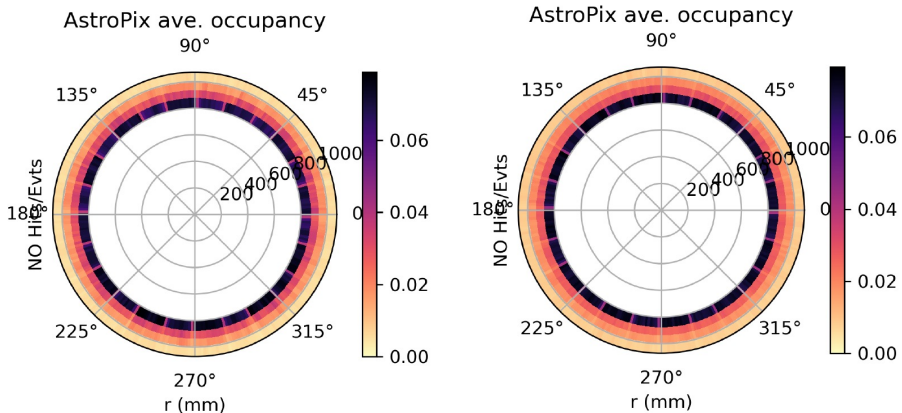
(Tot Hz)	all-sect	hottest-sect
DIS:	1.39e+07	3.11e+05
e- beam bkg:	2.66e+06	6.52e+04
P beam bkg:	9.93e+04	1.37e+04
Tot.:	1.74e+07	3.85e+05

AstroPix E-Threshold = 15 keV

By chips by 12 modules

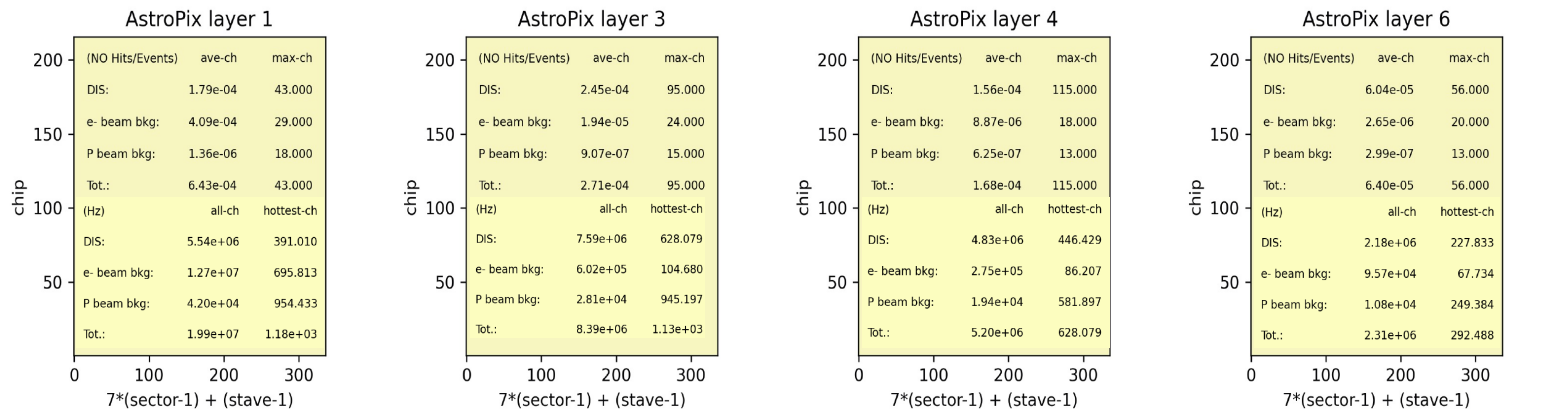
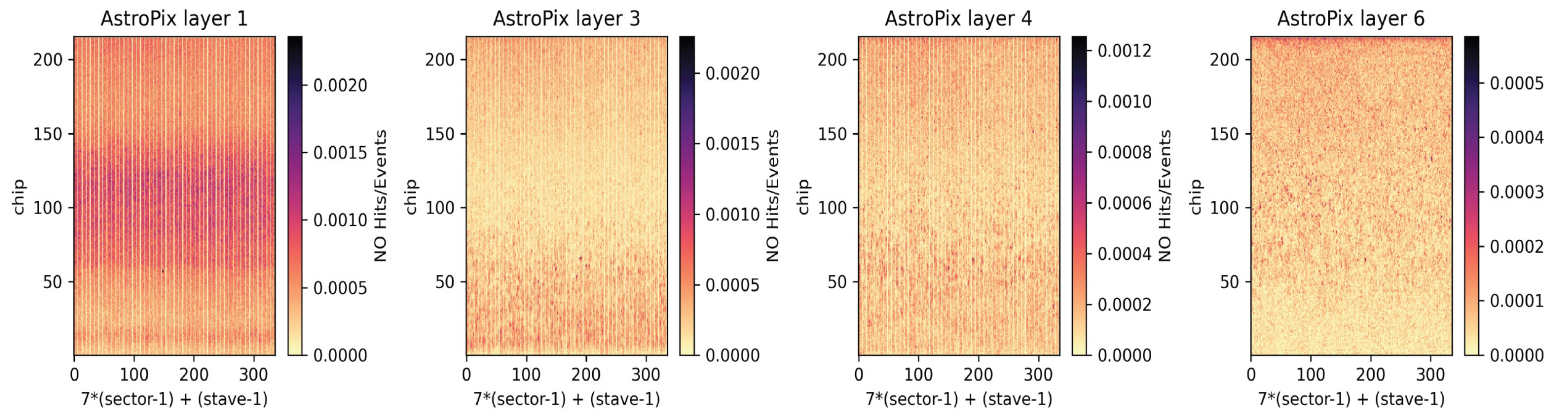
Module <=11

Module >11



By chips by sector-stave

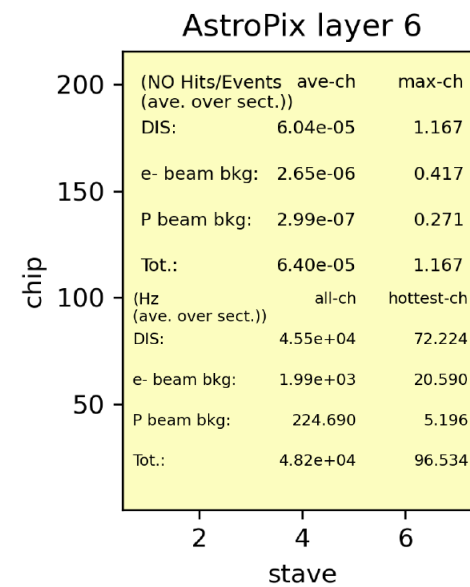
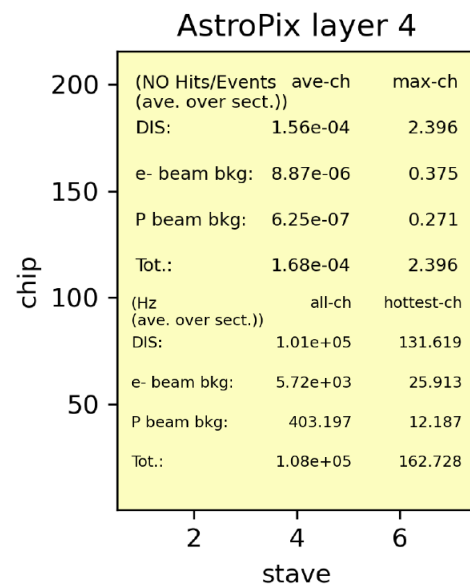
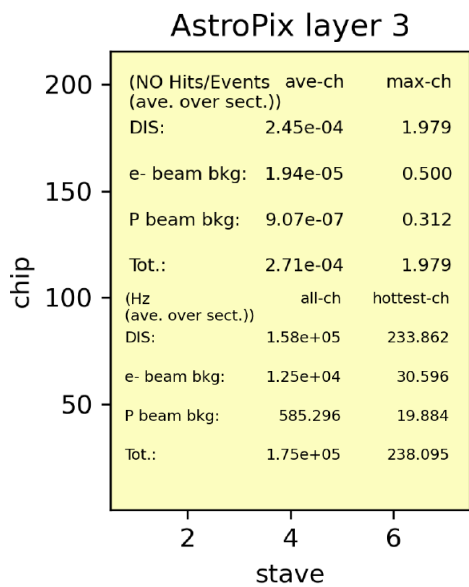
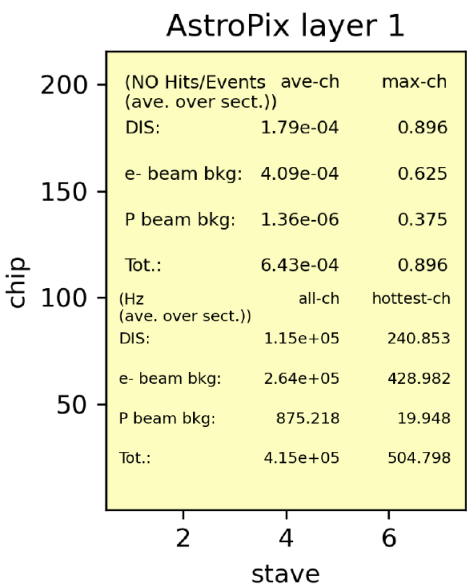
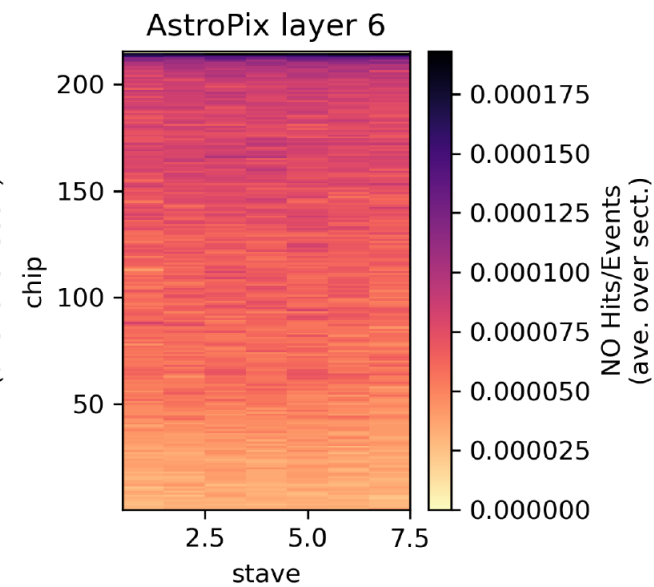
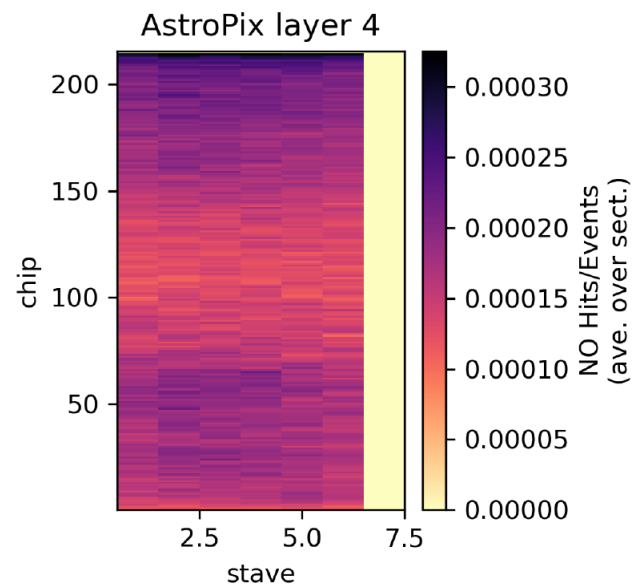
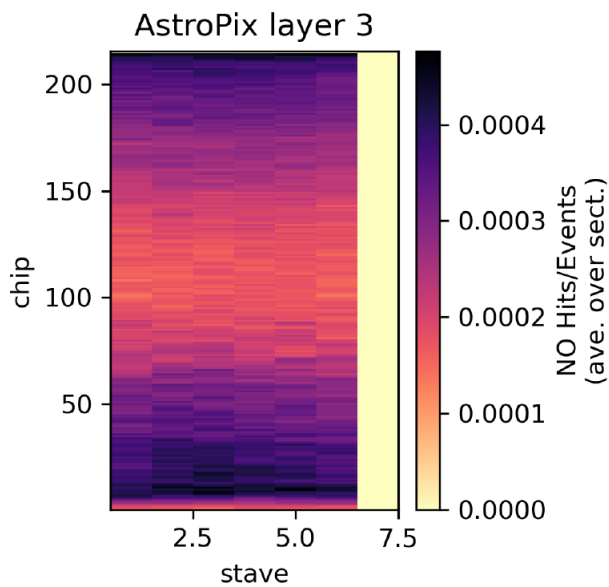
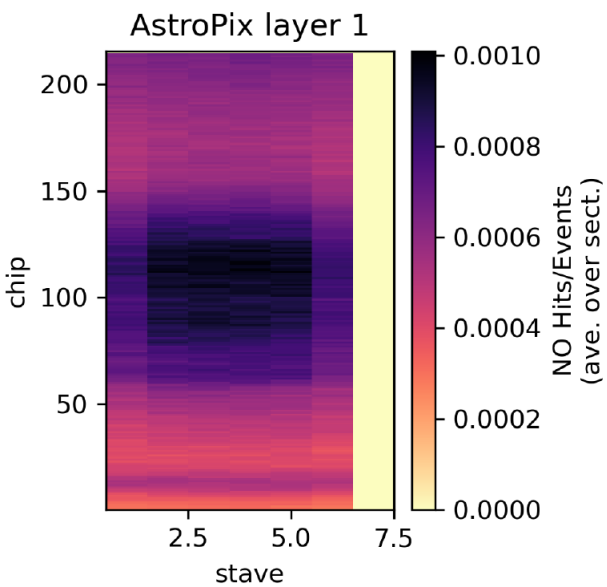
AstroPix E-threshold > 14.999999599999999 keV (fsamp uncor.) NO Events = 162400



(NO Hits/Events)	ave-sect	max-sect	(NO Hits/Events)	ave-sect	max-sect
DIS:	0.016	153.000	DIS:	0.018	183.000
e- beam bkg:	0.012	42.000	e- beam bkg:	0.011	35.000
P beam bkg:	4.59e-05	18.000	P beam bkg:	1.22e-04	41.000
Tot.:	0.029	153.000	Tot.:	0.031	183.000
(Hz)	all-sect	hottest-sect	(Hz)	all-sect	hottest-sect
DIS:	9.40e+06	3.17e+04	DIS:	1.08e+07	2.49e+04
e- beam bkg:	7.19e+06	5.14e+04	e- beam bkg:	6.48e+06	4.37e+04
P beam bkg:	2.74e+04	1.48e+03	P beam bkg:	7.28e+04	1.47e+03
Tot.:	1.76e+07	7.23e+04	Tot.:	1.83e+07	7.38e+04

AstroPix E-Threshold = 15 keV

By chips by stave (averaged over all sectors)

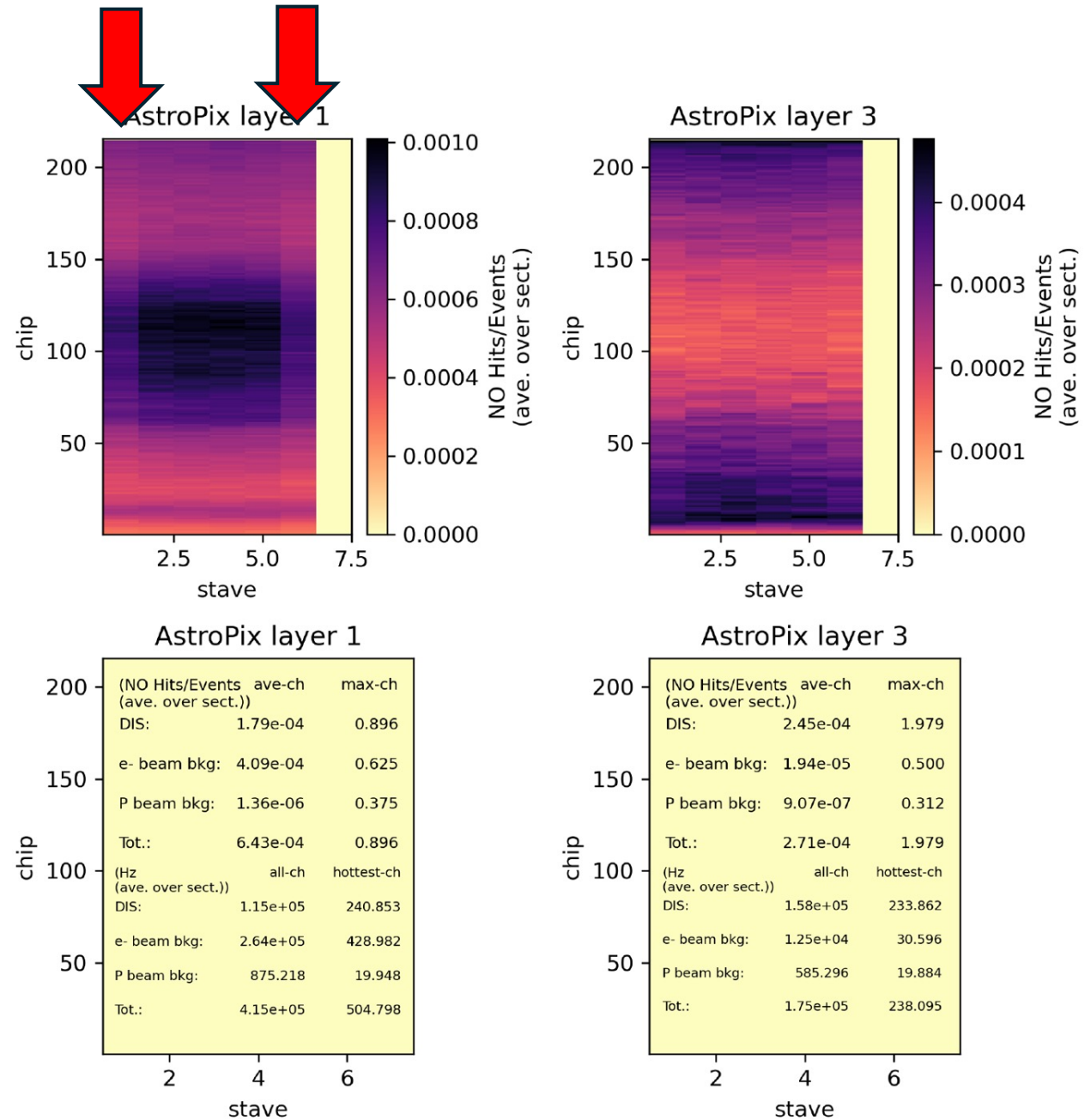


Occupancy summary

	DIS	Electron beam background	Proton Beam Background	All Sources	
ScFi/Pb layers					
Hottest Channel Avg	13.80	9.82	1.64	25.80kHz	
Channel Avg	5.26	0.99	0.04	6.56kHz	
Total	30.30	5.70	0.23	37.80MHz	
Imaging Layers (E > 15 keV)					
Hottest Channel Avg	0.63	0.70	0.95	1.18kHz	
Channel Avg	159.37	109.79	0.79	285.09Hz	
Total	20.14	13.67	0.10	35.80MHz	

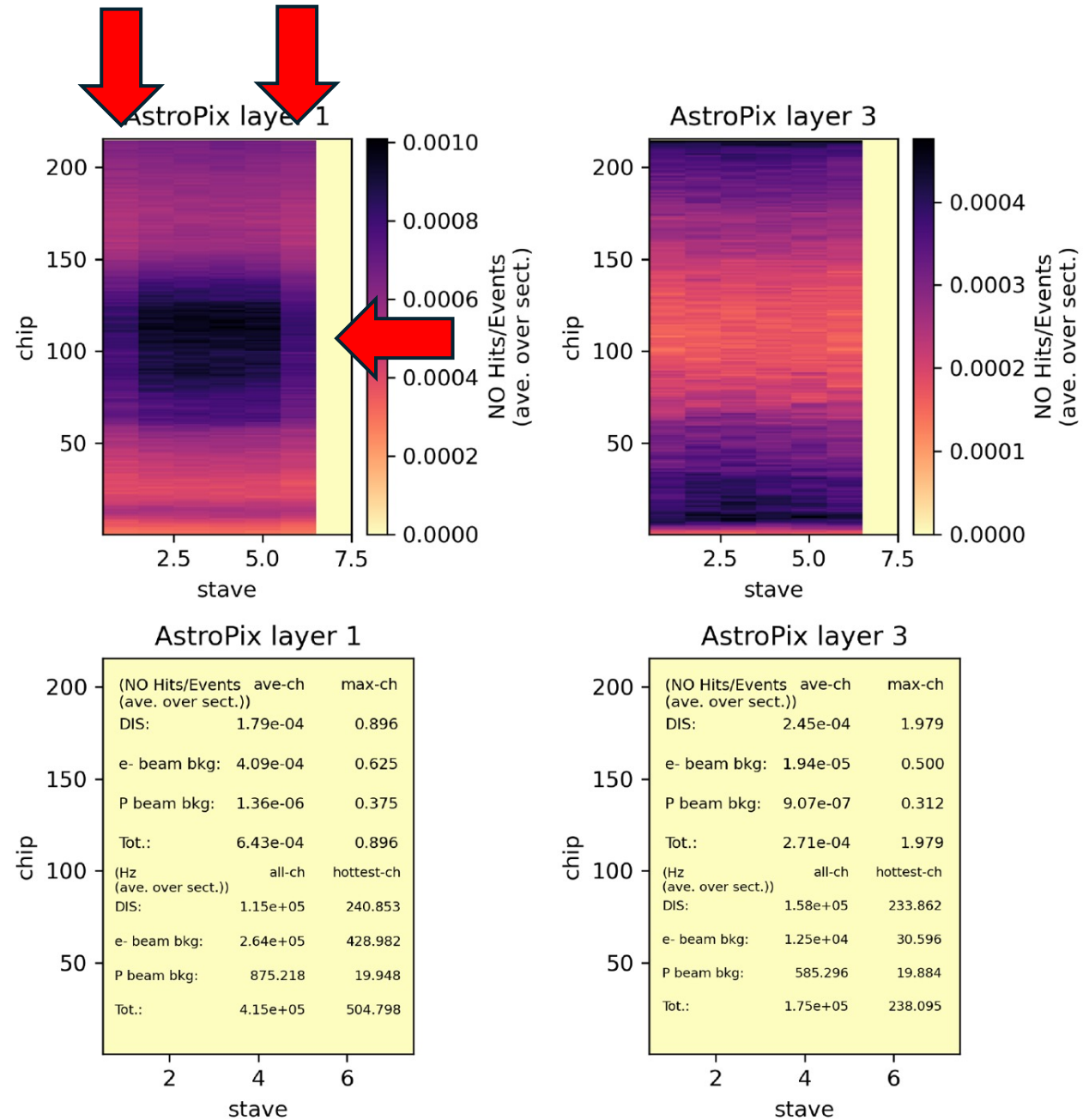
Observations:

1. AstroPix layer 1 stave 1 and 6 oddly has fewer hits than the rest.



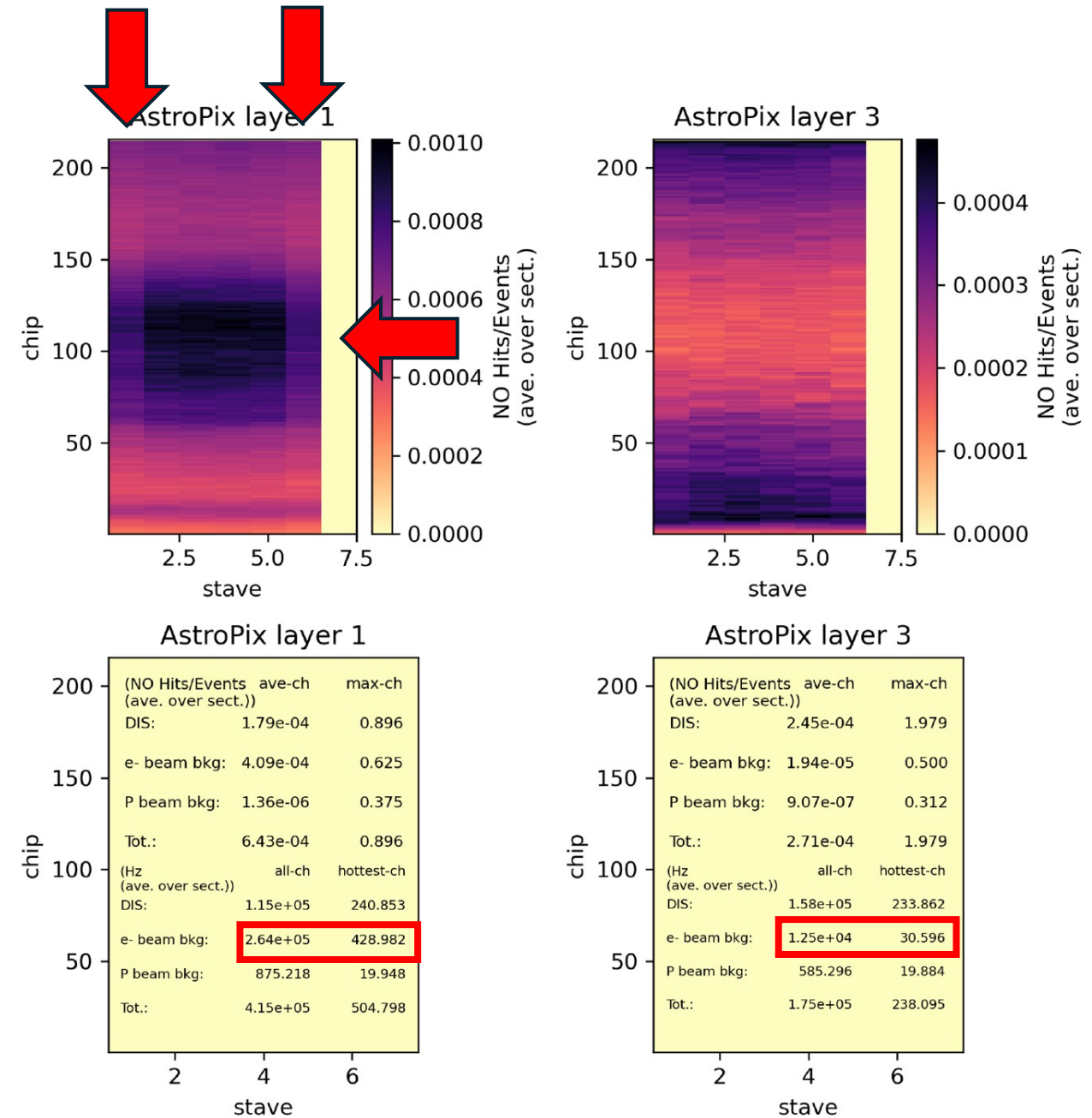
Observations:

1. AstroPix layer 1 stave 1 and 6 oddly has fewer hits than the rest.
2. AstroPix layer 1 received the most hits near chip~100.



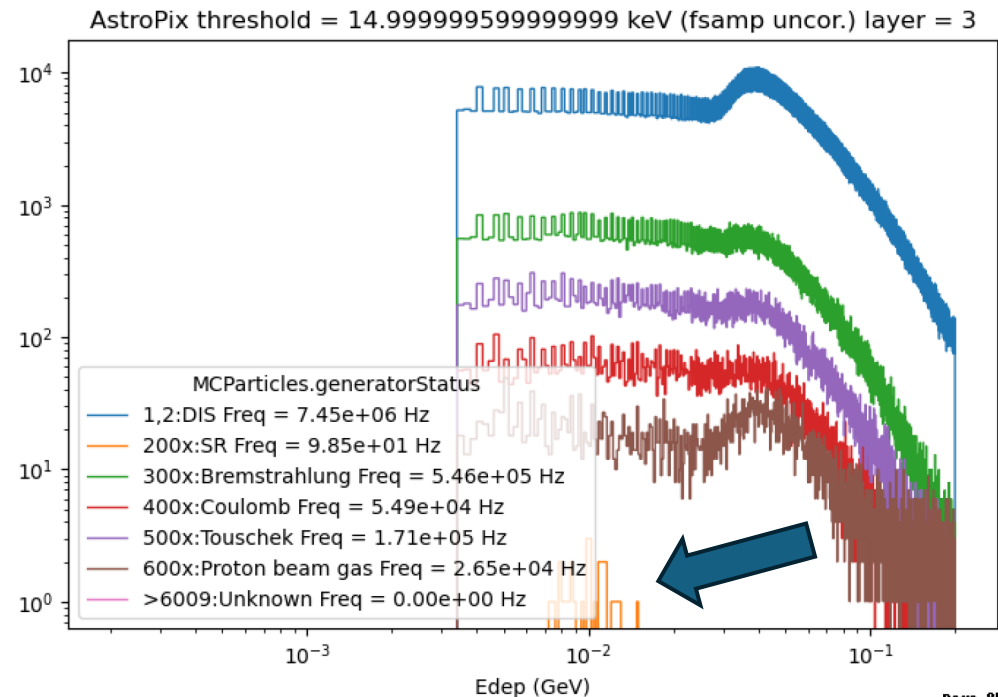
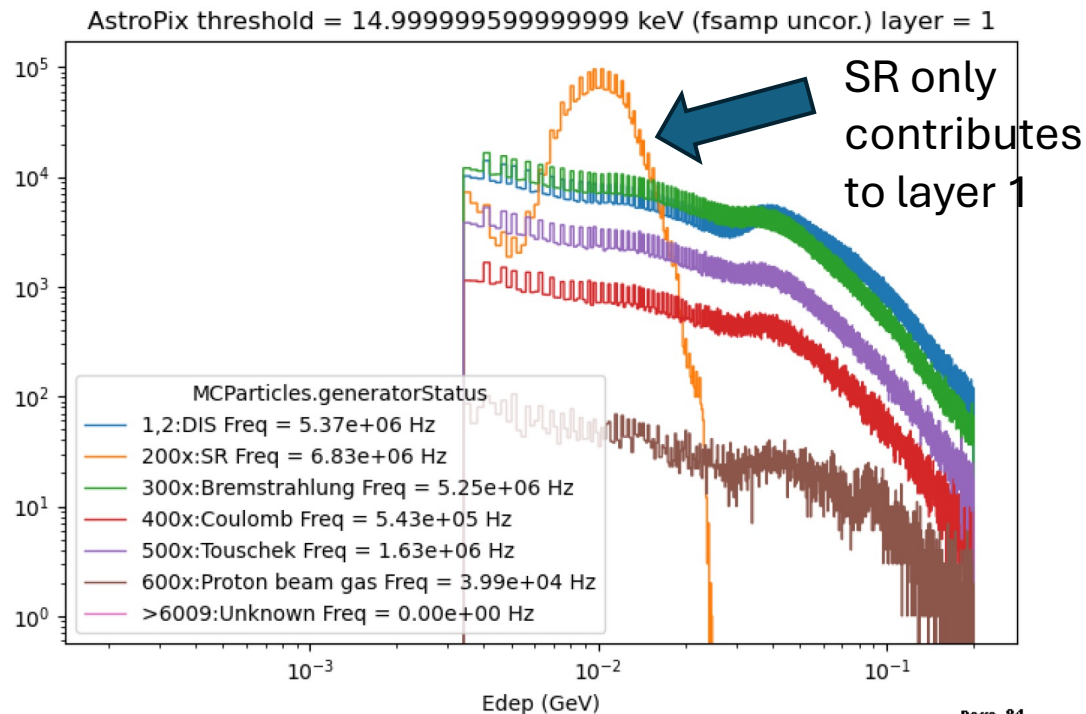
Observations:

1. AstroPix layer 1 stave 1 and 6 oddly has fewer hits than the rest.
2. AstroPix layer 1 received the most hits near chip~100.
3. AstroPix layer 1 has significantly **more hits from e- background** than other layers.



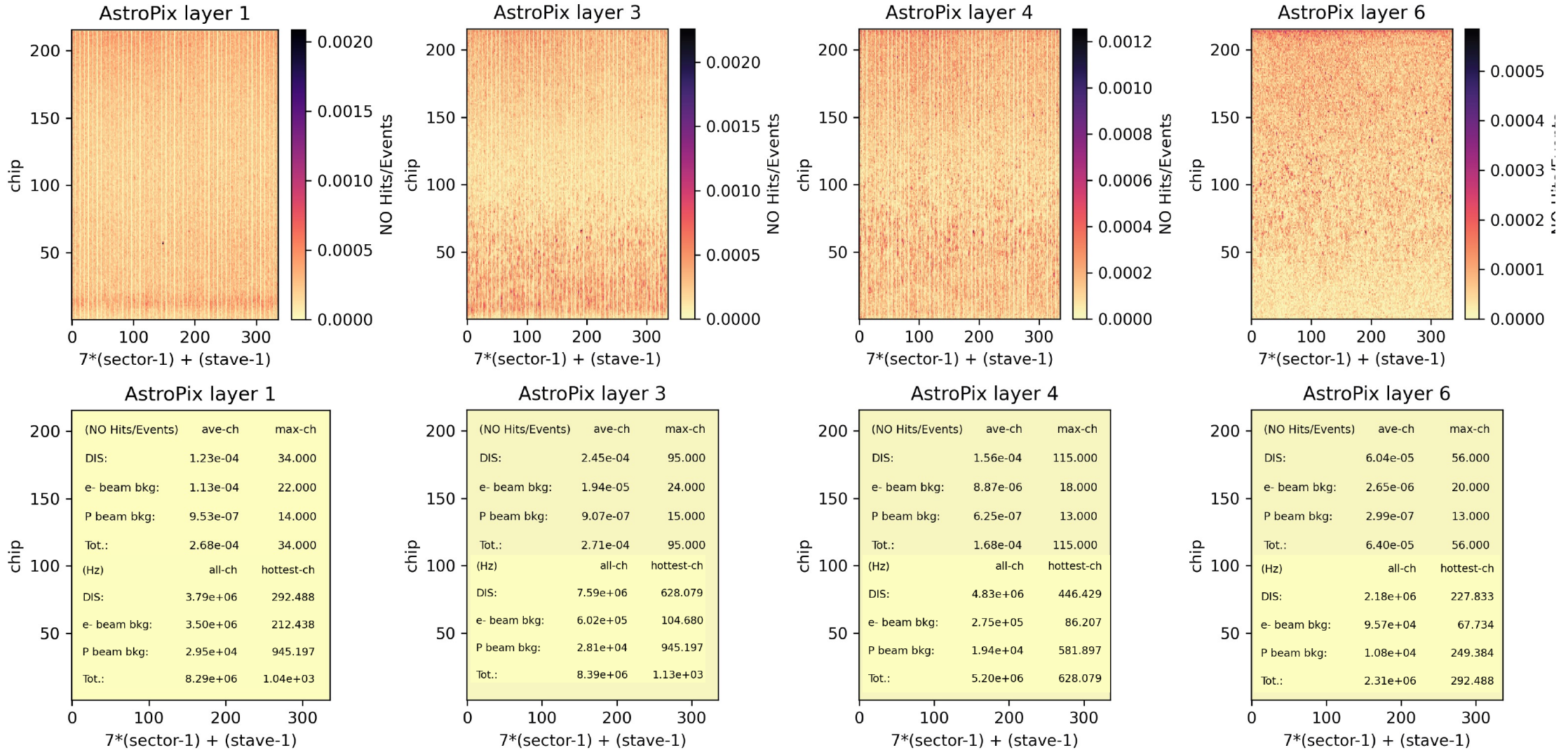
Reason for these odd behavior

- Significant hits from SR on the first layer.
- SR are easily blocked by any material.
- Stave 1 and 6 got less hits because they are overlapped by nearby sectors.
- Can be eliminated by higher threshold on AstroPix layer 1.



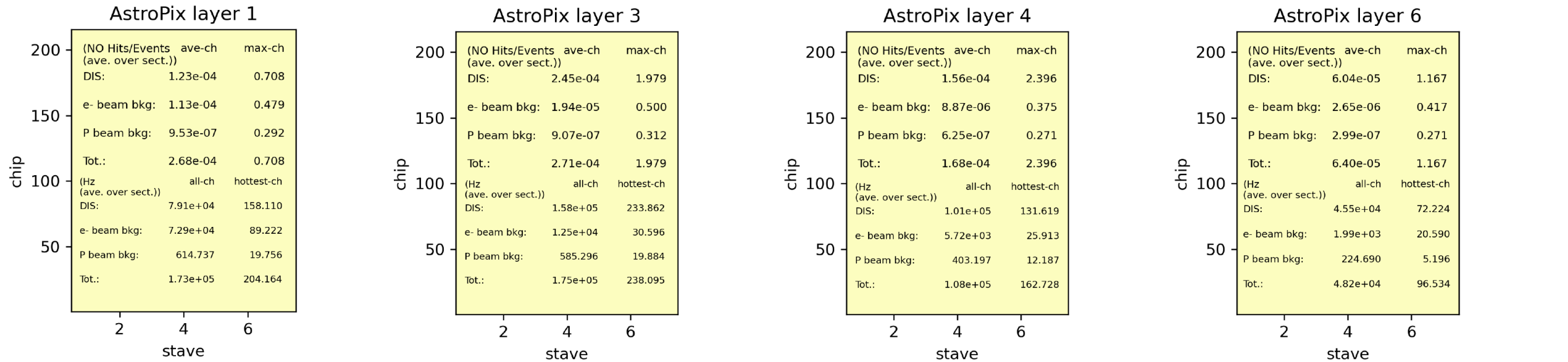
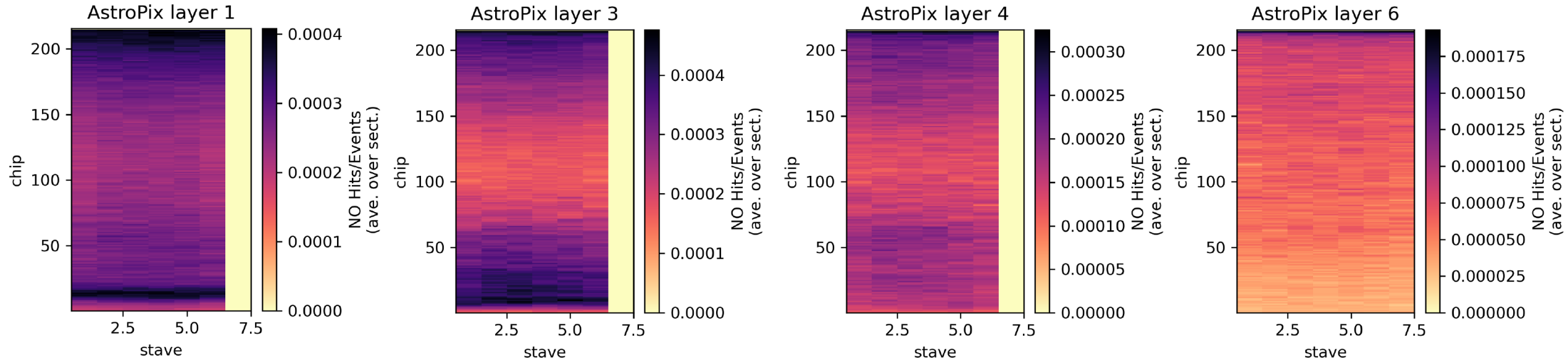
AstroPix E-Threshold = 86 keV (layer 1) and 15 keV (layer 3,4,6)

By chips by sector-stave



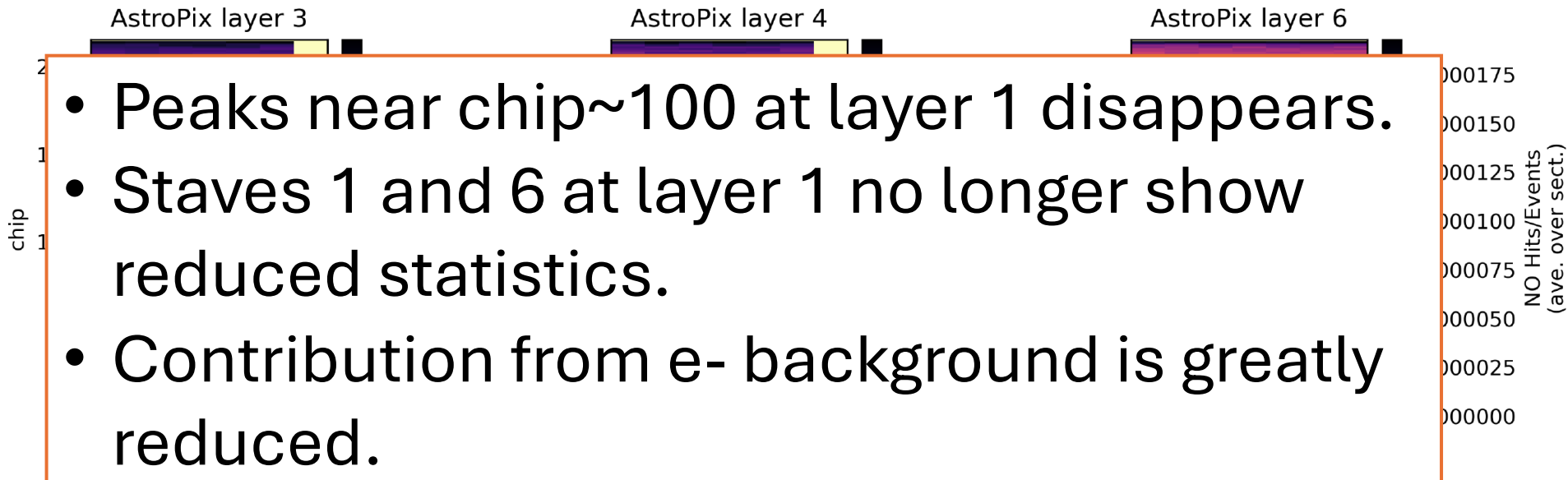
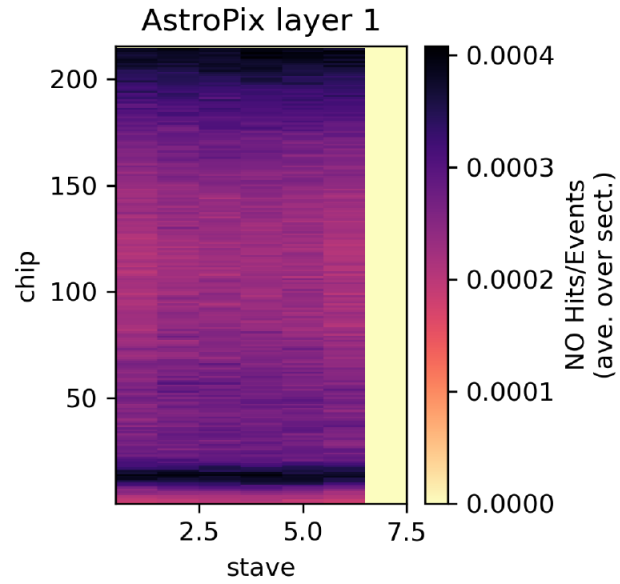
AstroPix E-Threshold = 86 keV (layer 1) and 15 keV (layer 3,4,6)

By chips by stave (averaged over all sectors)

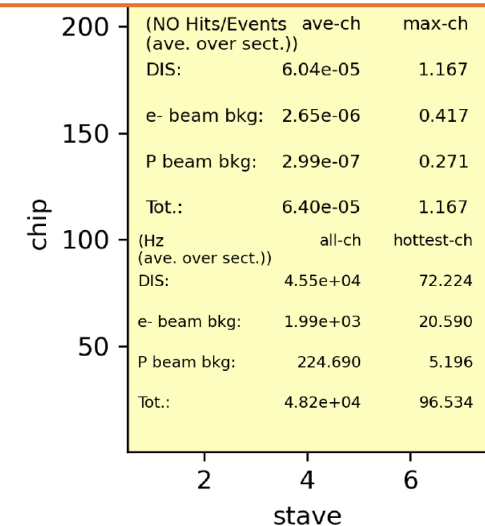
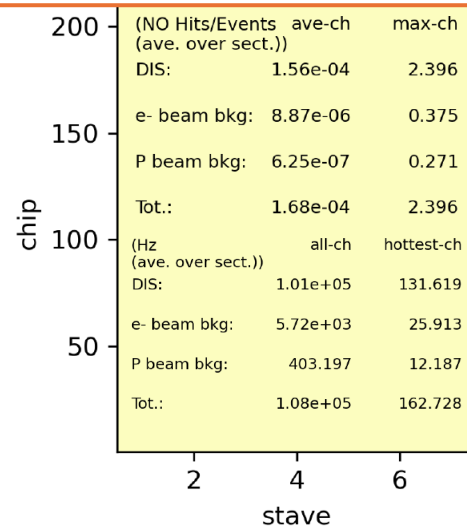
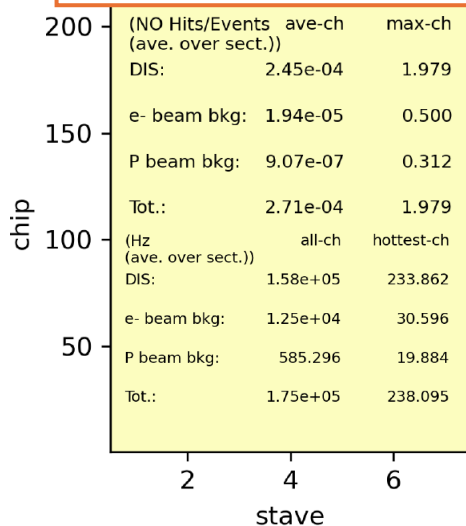
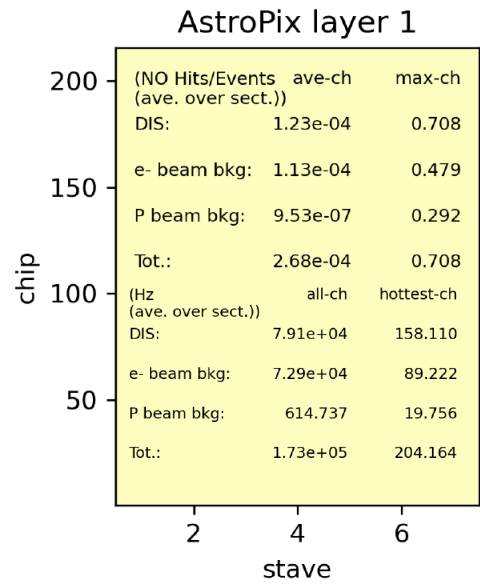


AstroPix E-Threshold = 86 keV (layer 1) and 15 keV (layer 3,4,6)

By chips by stave (averaged over all sectors)



- Peaks near chip~100 at layer 1 disappears.
- Staves 1 and 6 at layer 1 no longer show reduced statistics.
- Contribution from e- background is greatly reduced.



Occupancy summary

	DIS	Electron beam background	Proton Beam Background	All Sources	
ScFi/Pb layers					
Hottest Channel Avg	13.80	9.82	1.64	25.80kHz	
Channel Avg	5.26	0.99	0.04	6.56kHz	
Total	30.30	5.70	0.23	37.80MHz	
Imaging Layers (E > 15 keV)					
Hottest Channel Avg	0.63	0.70	0.95	1.18kHz	
Channel Avg	159.37	109.79	0.79	285.09Hz	
Total	20.14	13.67	0.10	35.80MHz	
Imaging Layers (E > 86 keV layer 1 only)					
Hottest Channel Avg	0.63	0.21	0.95	1.13kHz	
Channel Avg	122.16	14.46	0.51	141.14Hz	
Total	18.39	4.47	0.09	24.19MHz	