DEEP UNDERGROUND NEUTRINO EXPERIMENT

Brookhaven National Laboratory

U.S. DEPARTMENT OF ENERGY

LAr Transfer from NP04 to NP02

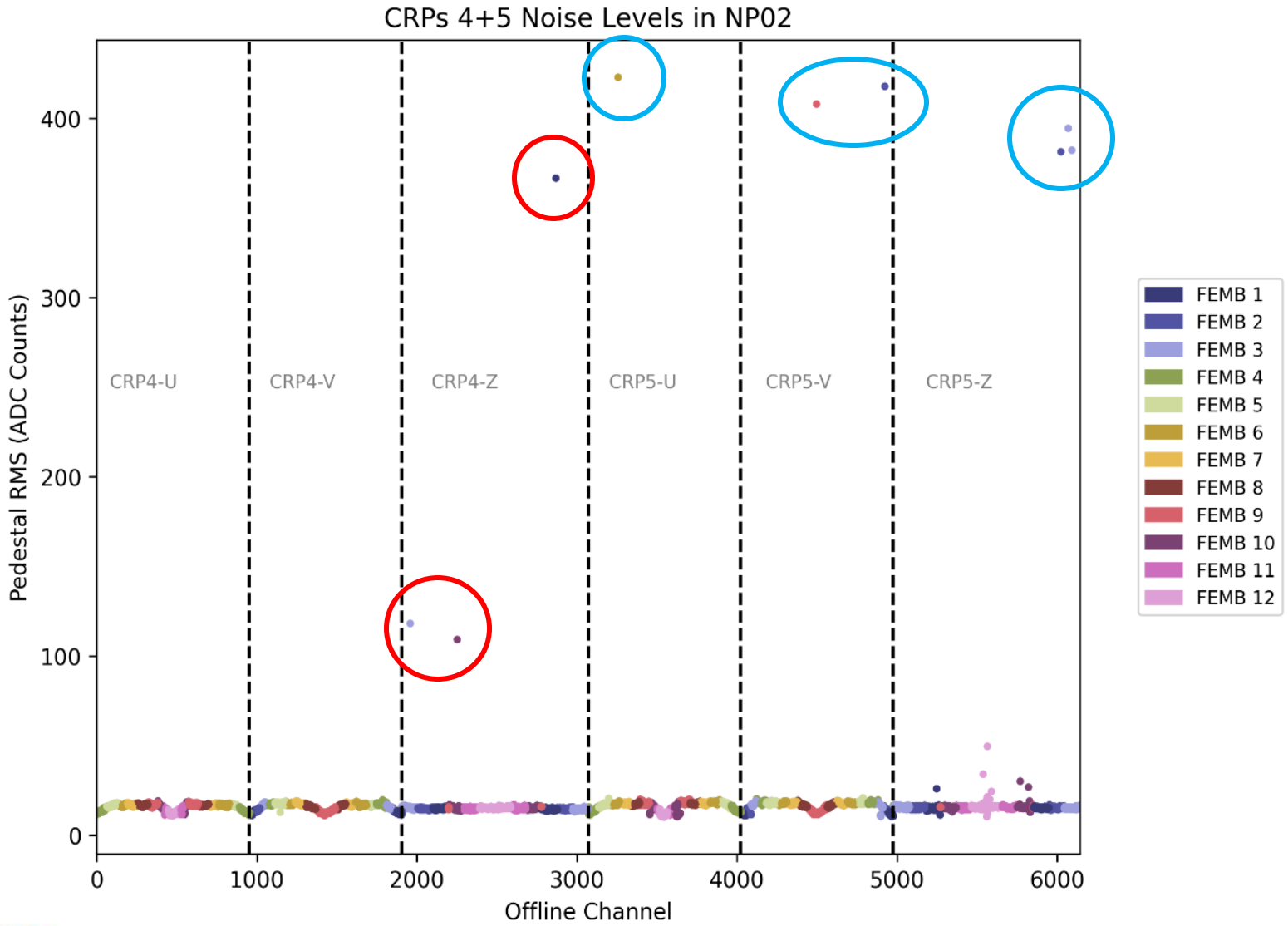
Noise Monitoring

Karla Téllez Girón Flores

12/09/2024

@BrookhavenLab

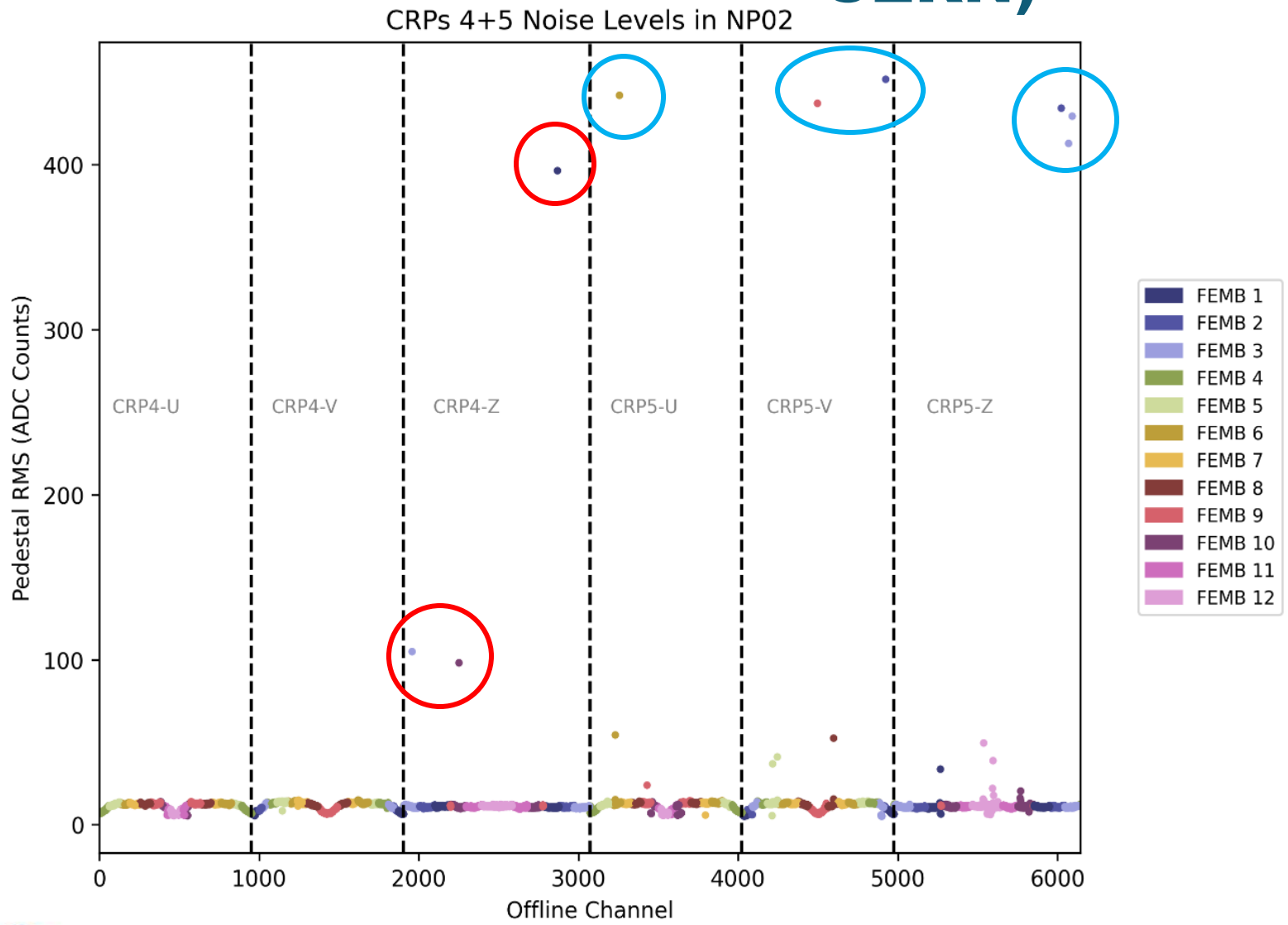
Before Transfer (Run 32962 from 11/18 @ ~9:46 AM CERN)



High-noise Outliers (known ✅)

High Noise Channels	RMS
1958	118.07
2250	108.56
2868	375.28
3254	436.07
4496	410.25
4921	429.62
6021	386.43
6069	383.58
6091	386.88

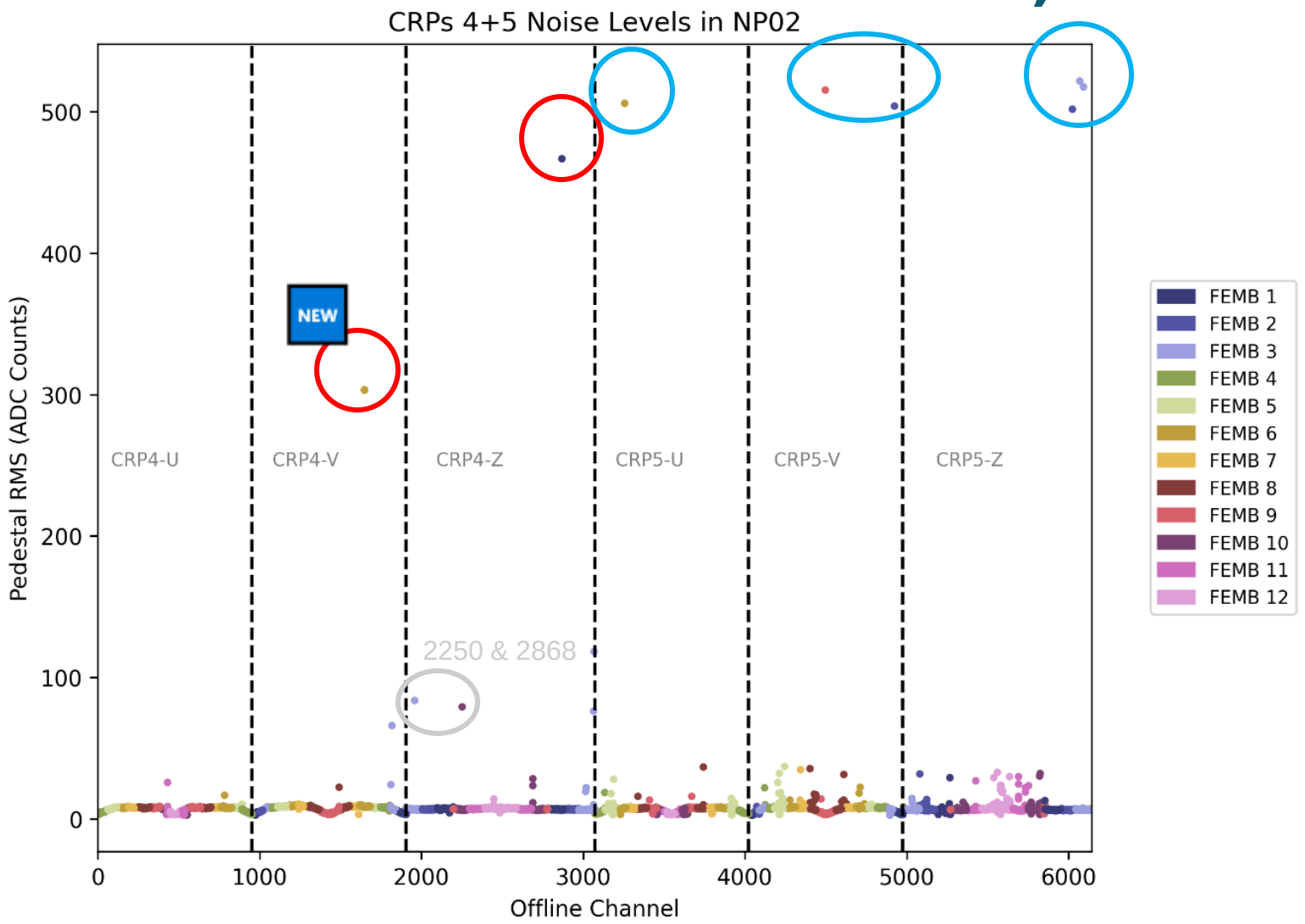
During Transfer (Run 32984 from Friday 12/06 ~2:01 PM CERN)



High-noise Outliers (known ✅)

High Noise Channels	RMS
1958	118.4
2250	109.5
2868	396.71
3254	442.38
4496	437.34
4921	429.49
6021	434.58
6069	413.22
6091	382.4

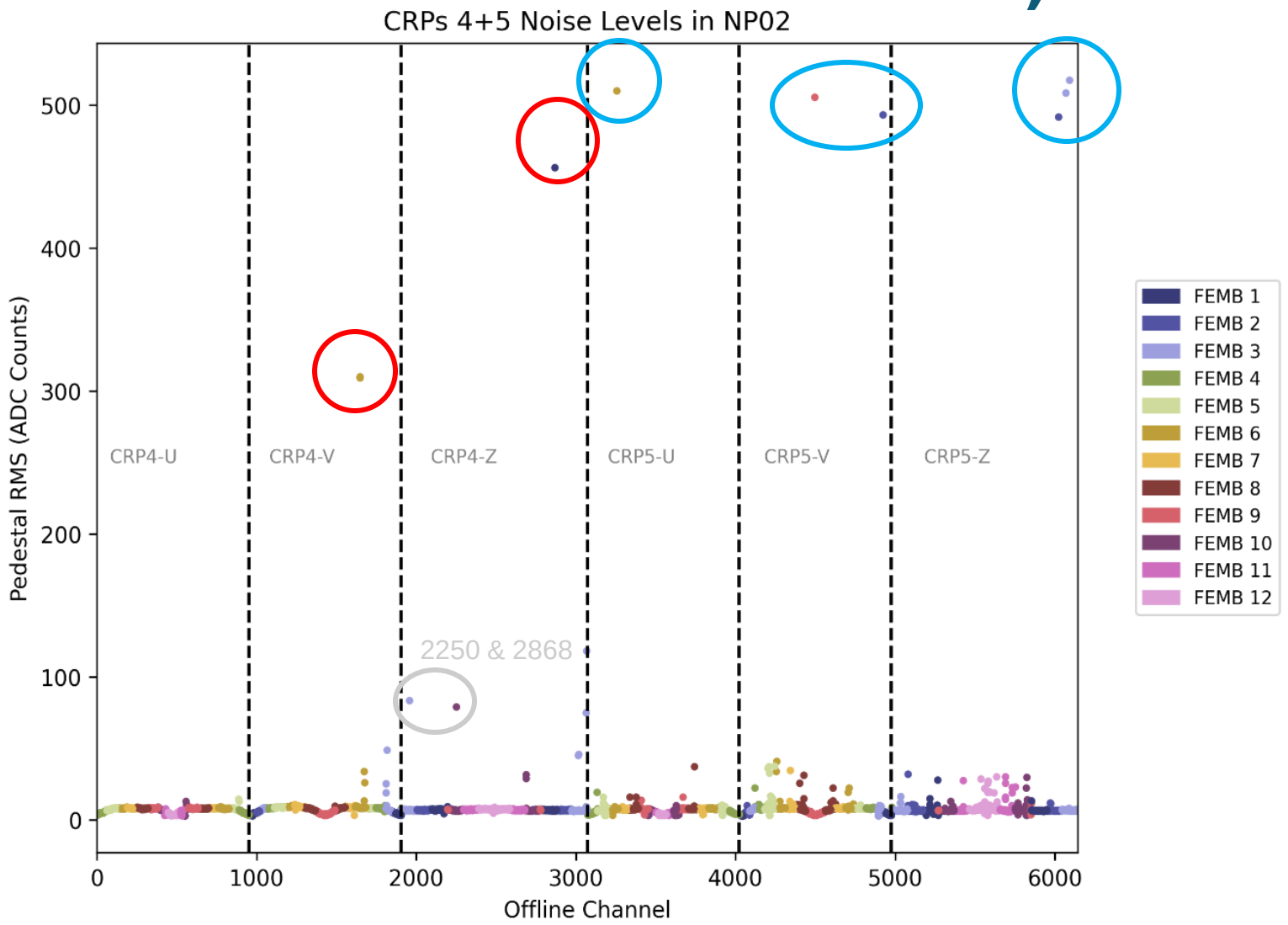
During Transfer (Run 32987 from Saturday 12/07 ~2:41 PM CERN)



High-noise Outliers:

High Noise Channels	RMS	
1646	303.14	NEW
1647	303.54	NEW
2868	466.97	
3254	506.10	
4496	515.53	
4921	504.31	
6021	501.93	
6069	521.91	
6091	517.88	

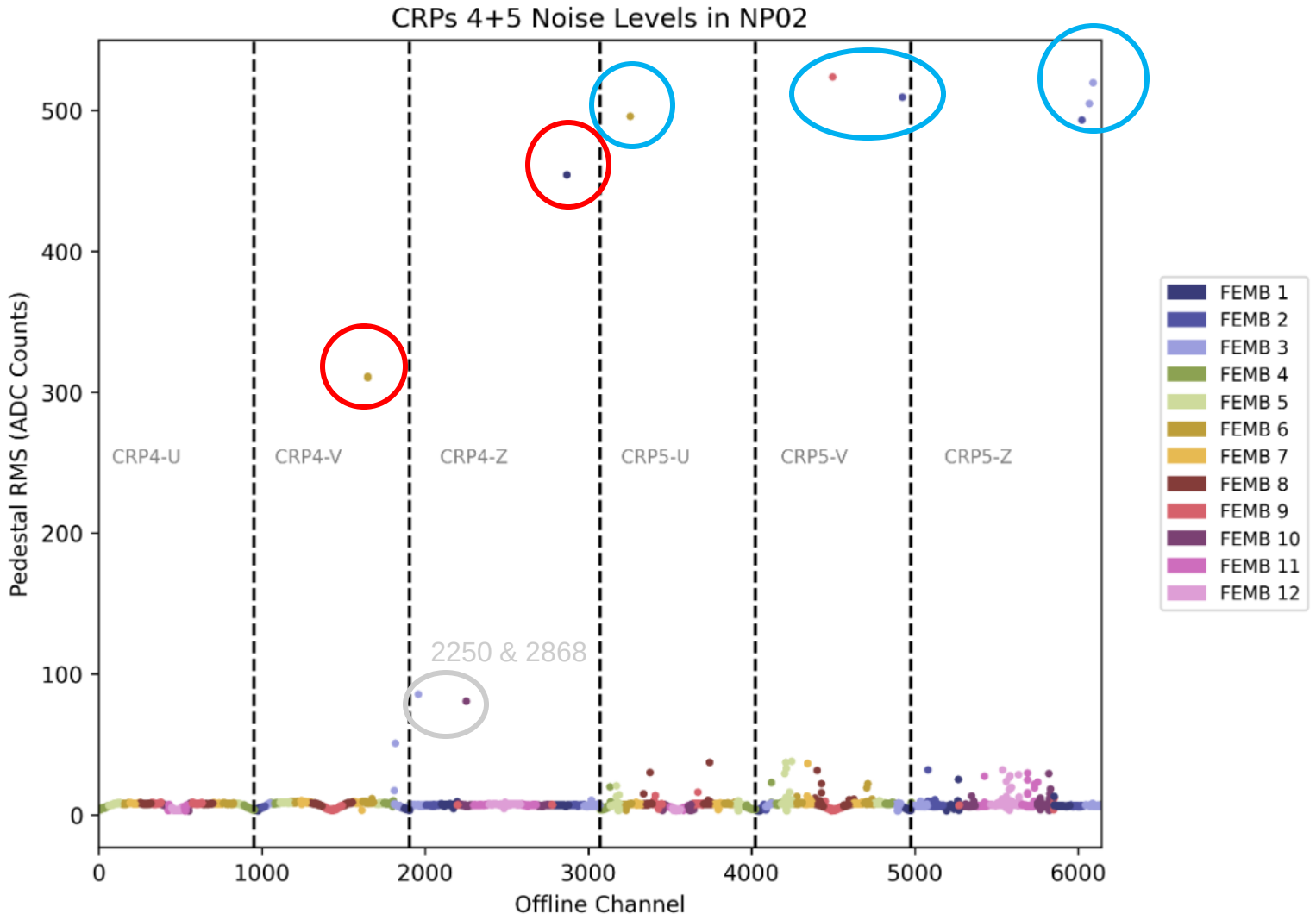
During Transfer (Run 32987 from Saturday 12/07 ~9:41 PM CERN)



High-noise Outliers:

High Noise Channels	RMS	
1646	309.36	NEW
1647	310.05	NEW
2868	456.24	
3254	509.97	
4496	505.71	
4921	493.14	
6021	491.78	
6069	508.60	
6091	517.51	

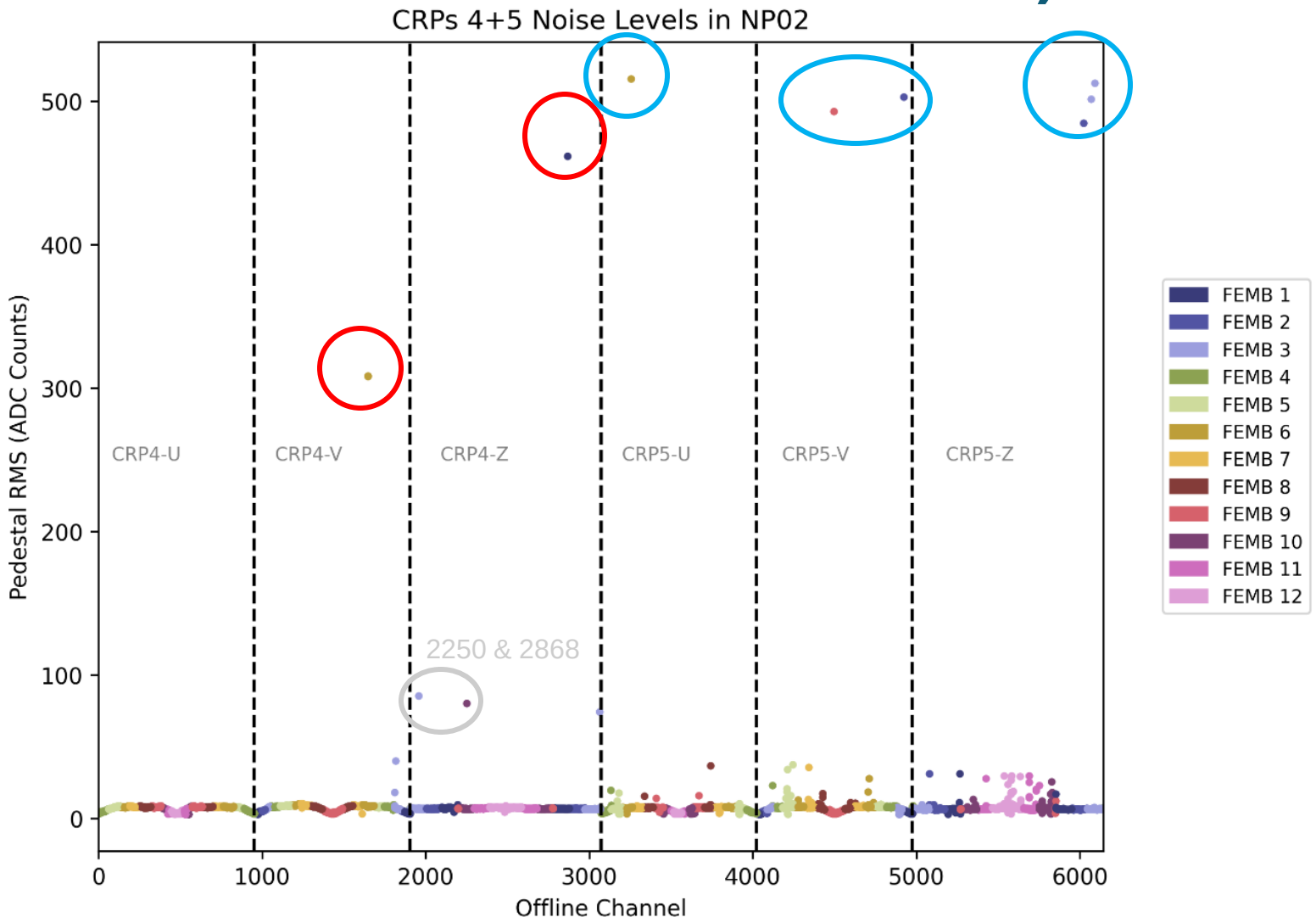
During Transfer (Run 33015 from Sunday 12/08 ~12:09 PM CERN)



High-noise Outliers:

High Noise Channels	RMS	
1646	310.32	NEW
1647	311.02	NEW
2868	454.16	
3254	495.99	
4496	523.78	
4921	509.41	
6021	498.10	
6069	505.06	
6091	519.74	

During Transfer (Run 33015 from Monday 12/09 ~8:00 AM CERN)

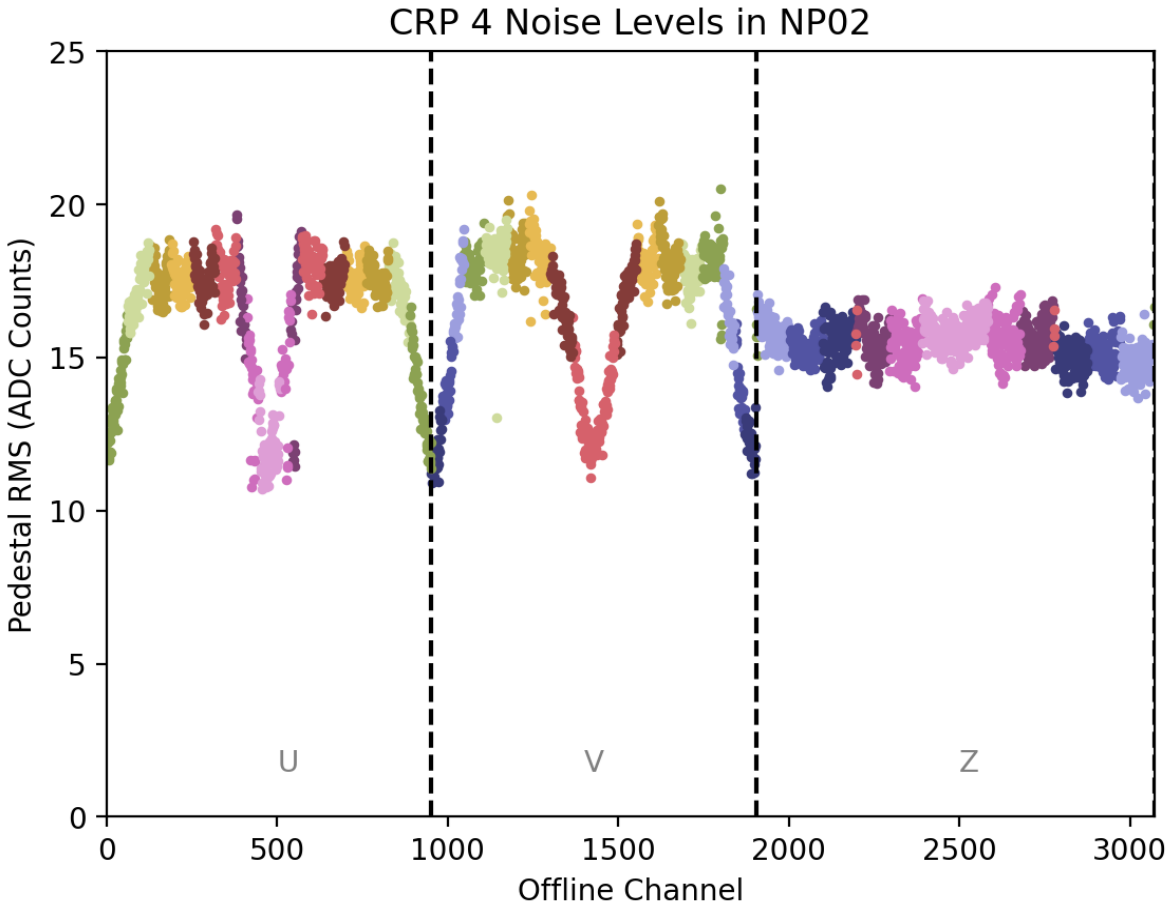


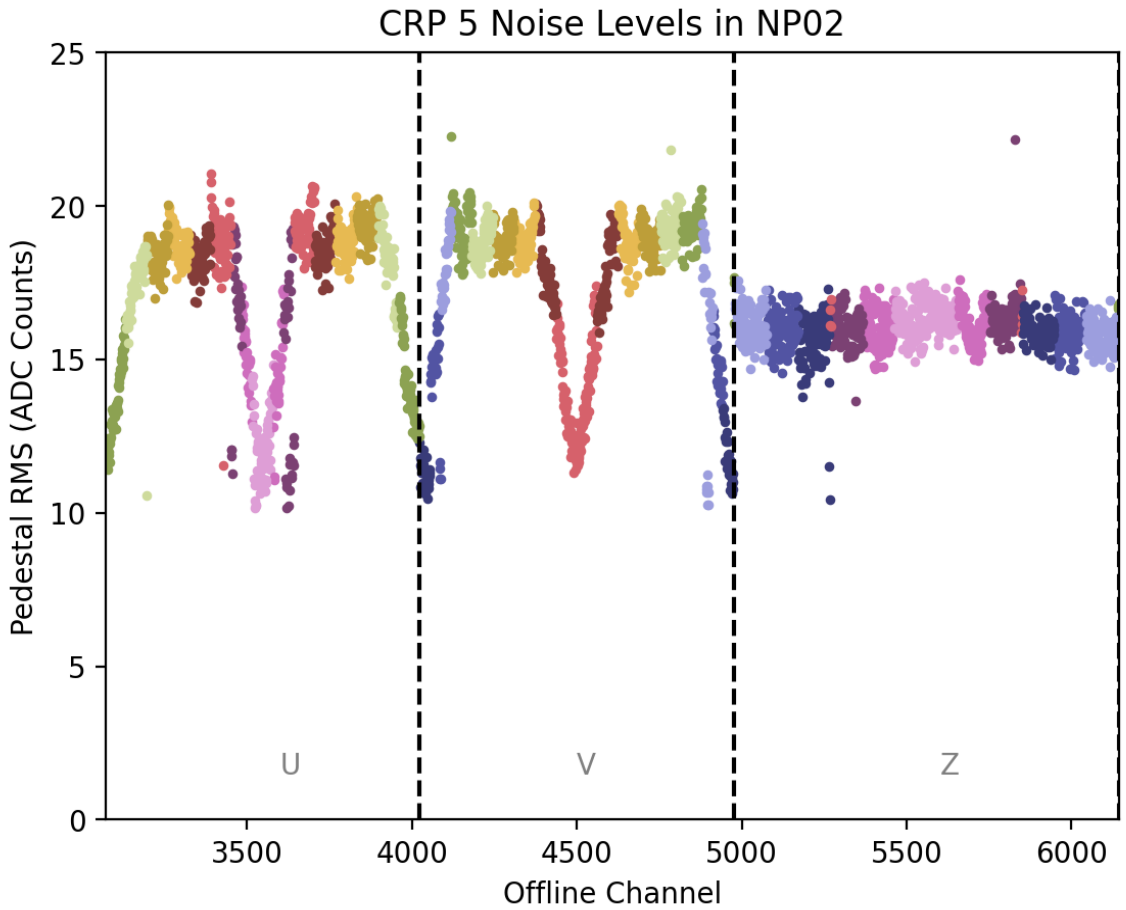
High-noise Outliers:

High Noise Channels	RMS	
1646	308.22	NEW
1647	308.63	NEW
2868	461.96	
3254	515.73	
4496	492.97	
4921	503.24	
6021	485.03	
6069	501.42	
6091	512.59	

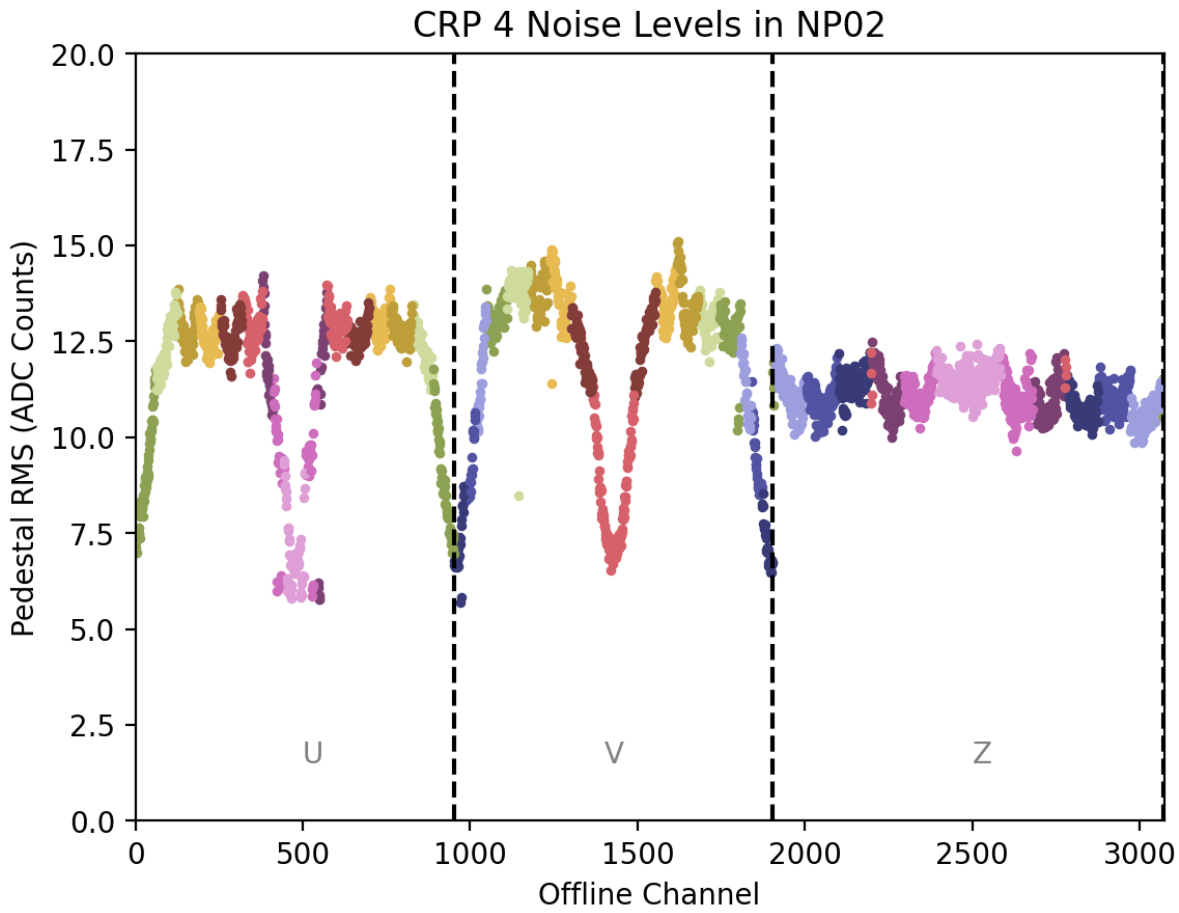
Detailed Versions of These Plots

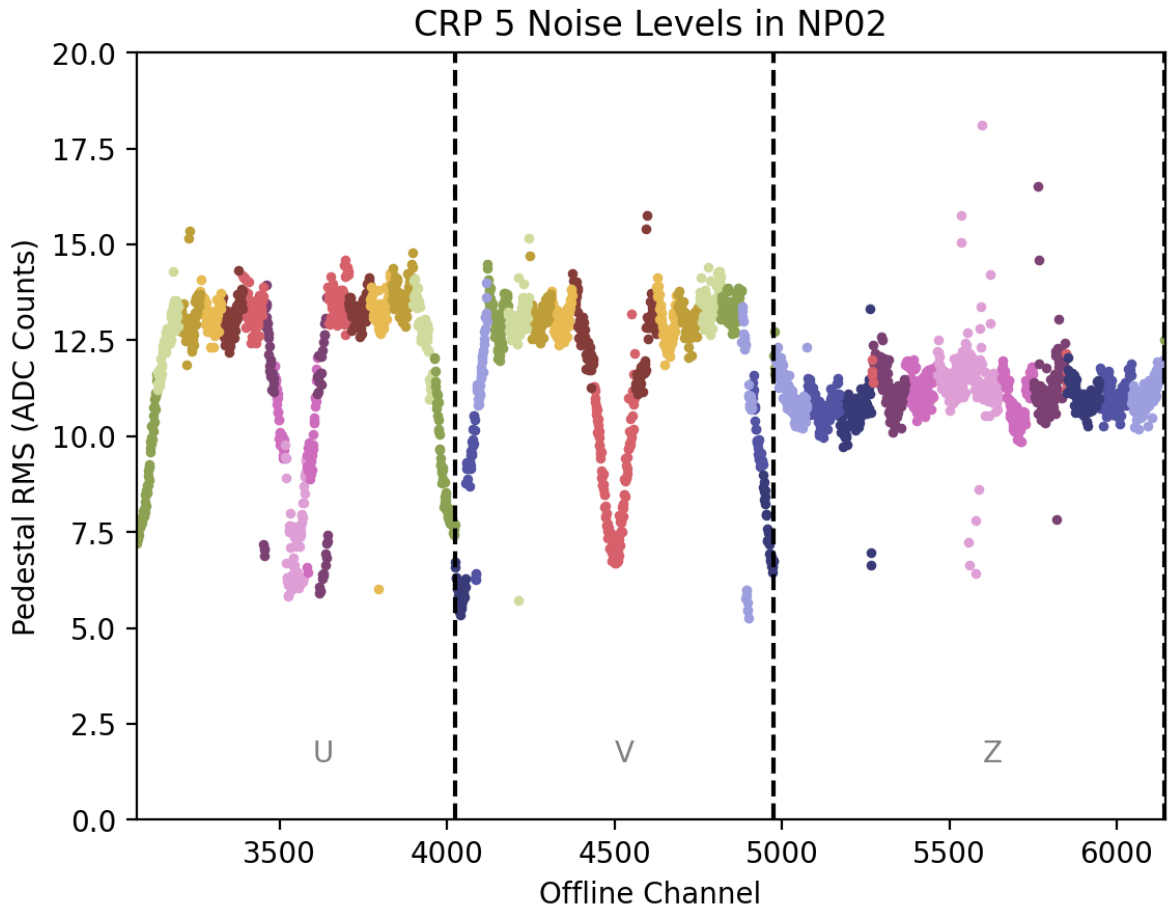
Before Transfer (Run 32962 from 11/18 @ ~9:46 AM CERN)



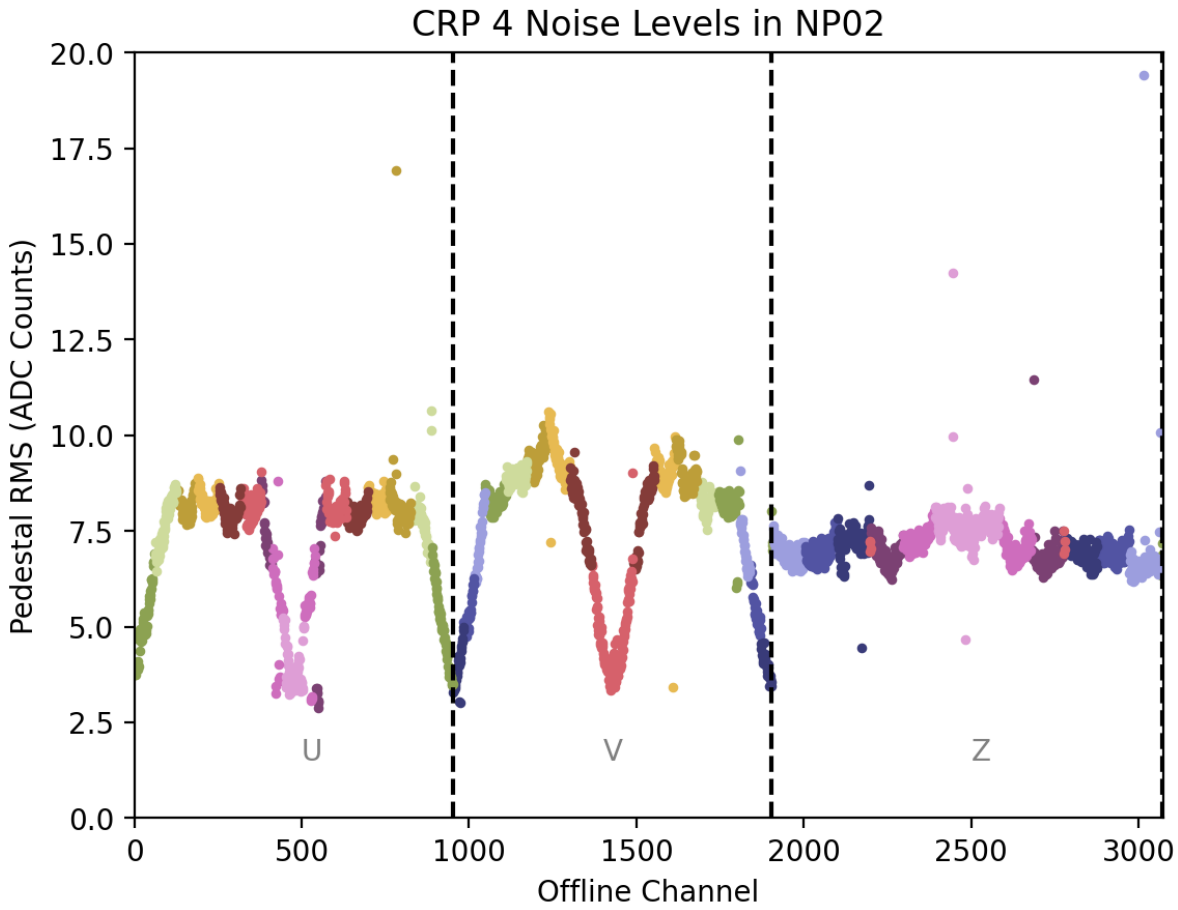


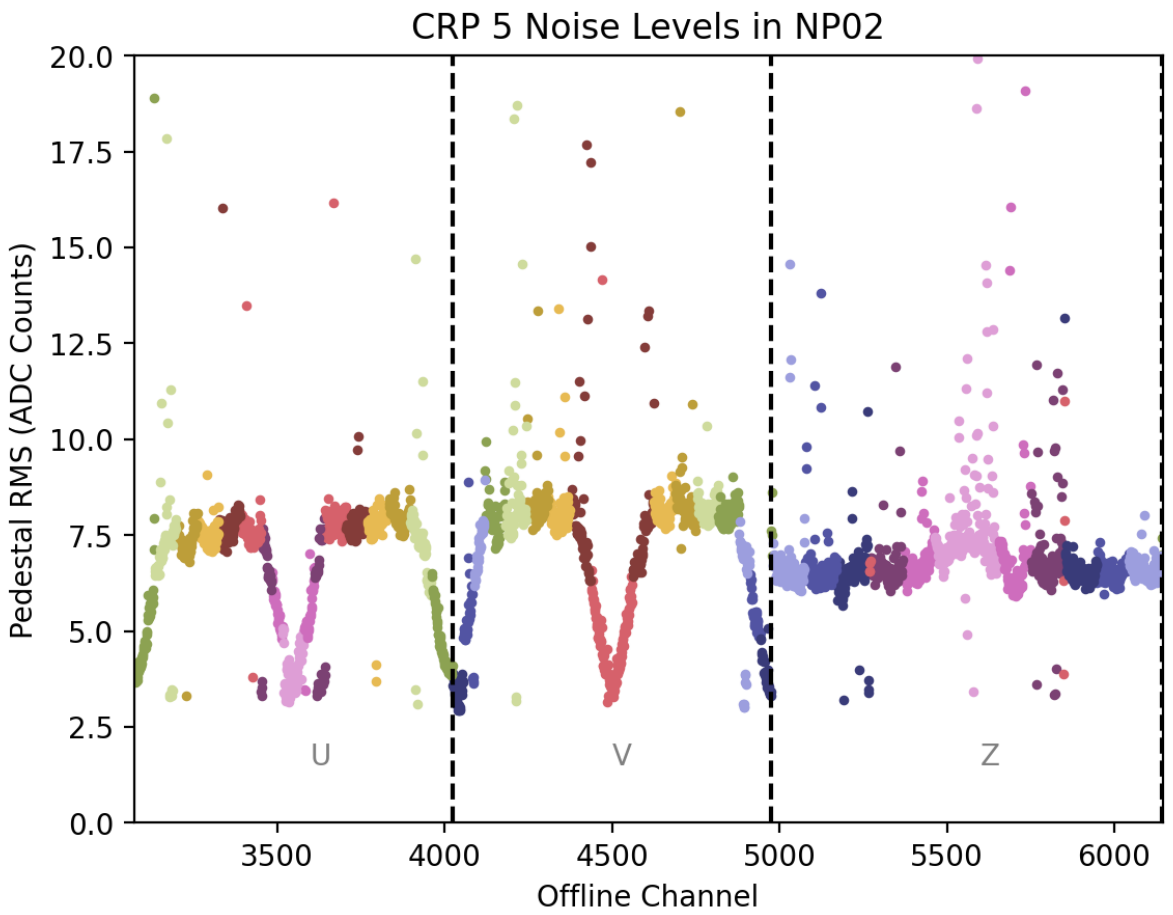
During Transfer (Run 32984 from Friday 12/06 ~2:01 PM CERN)



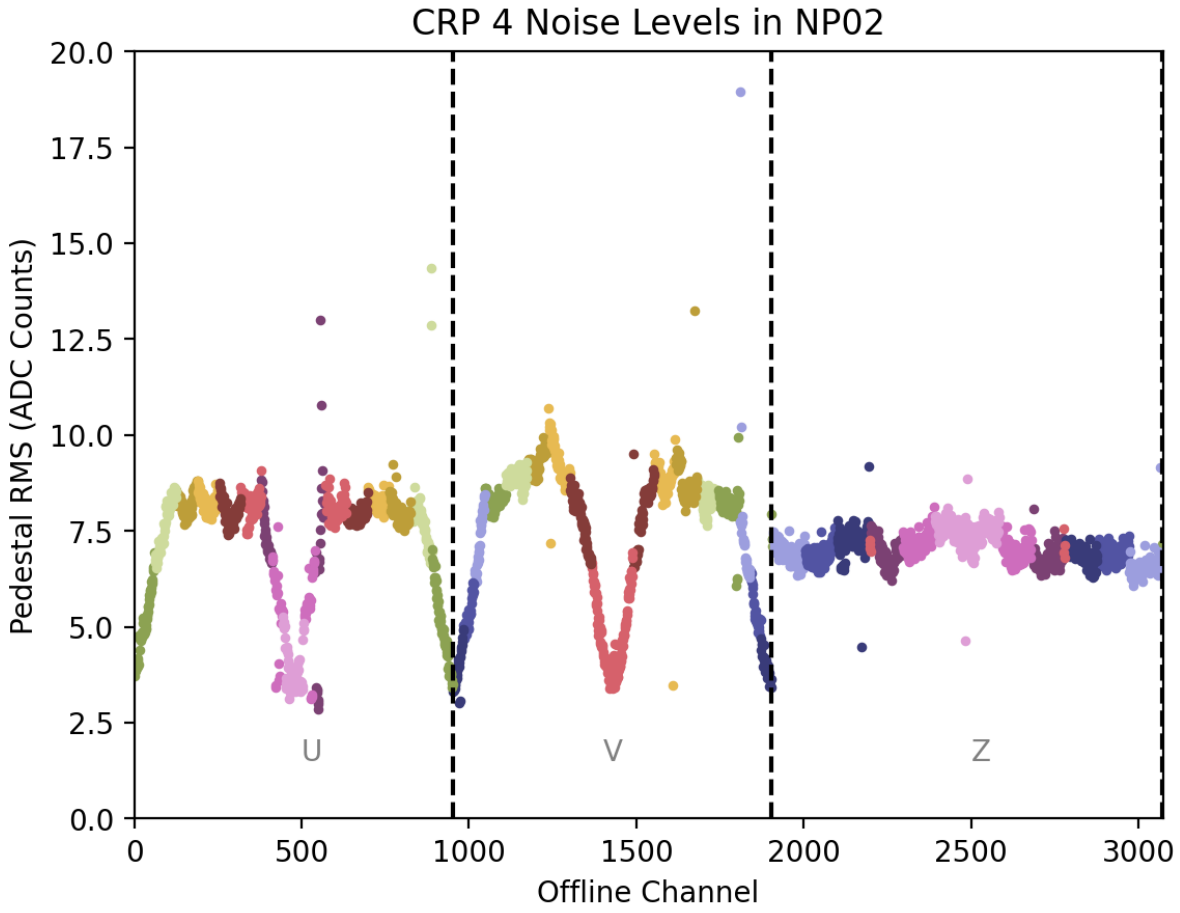


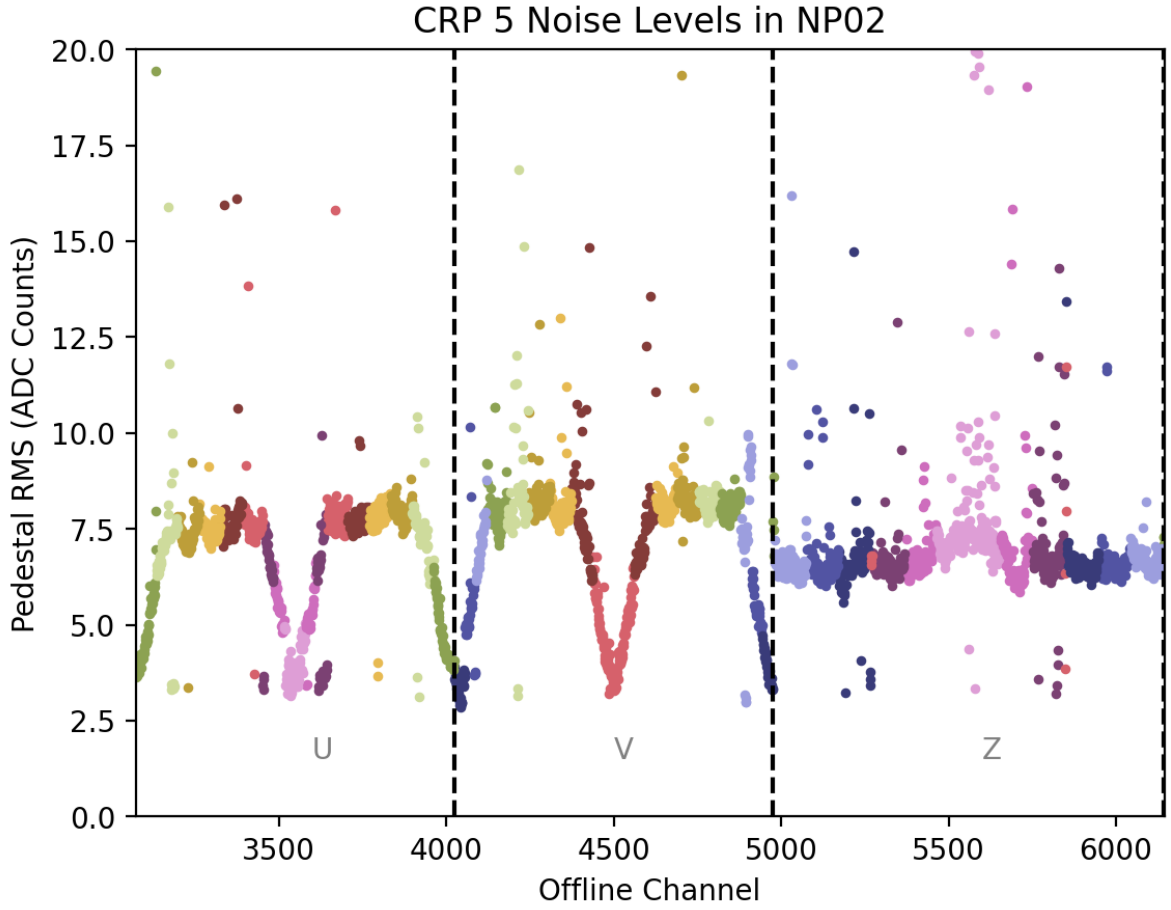
During Transfer (Run 32987 from Saturday 12/07 ~2:41 PM CERN)



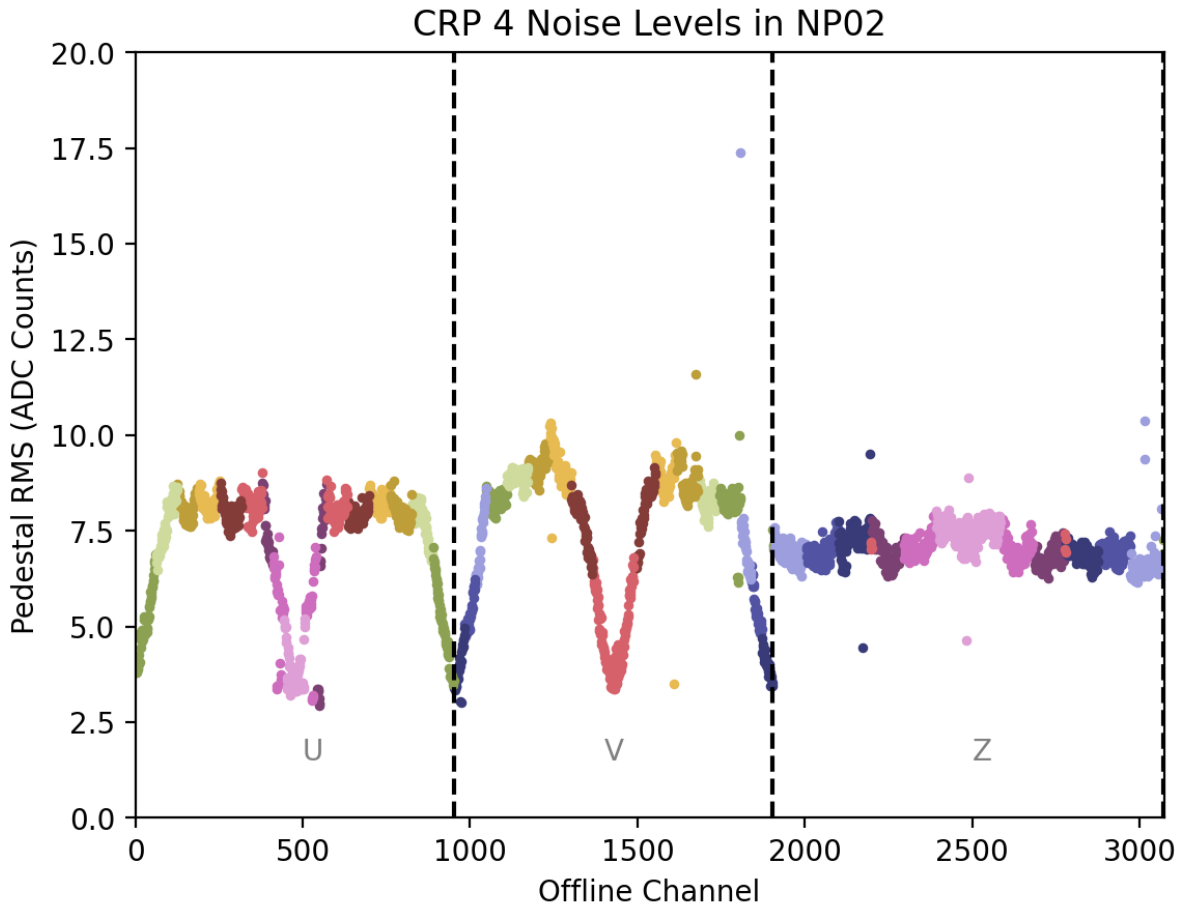


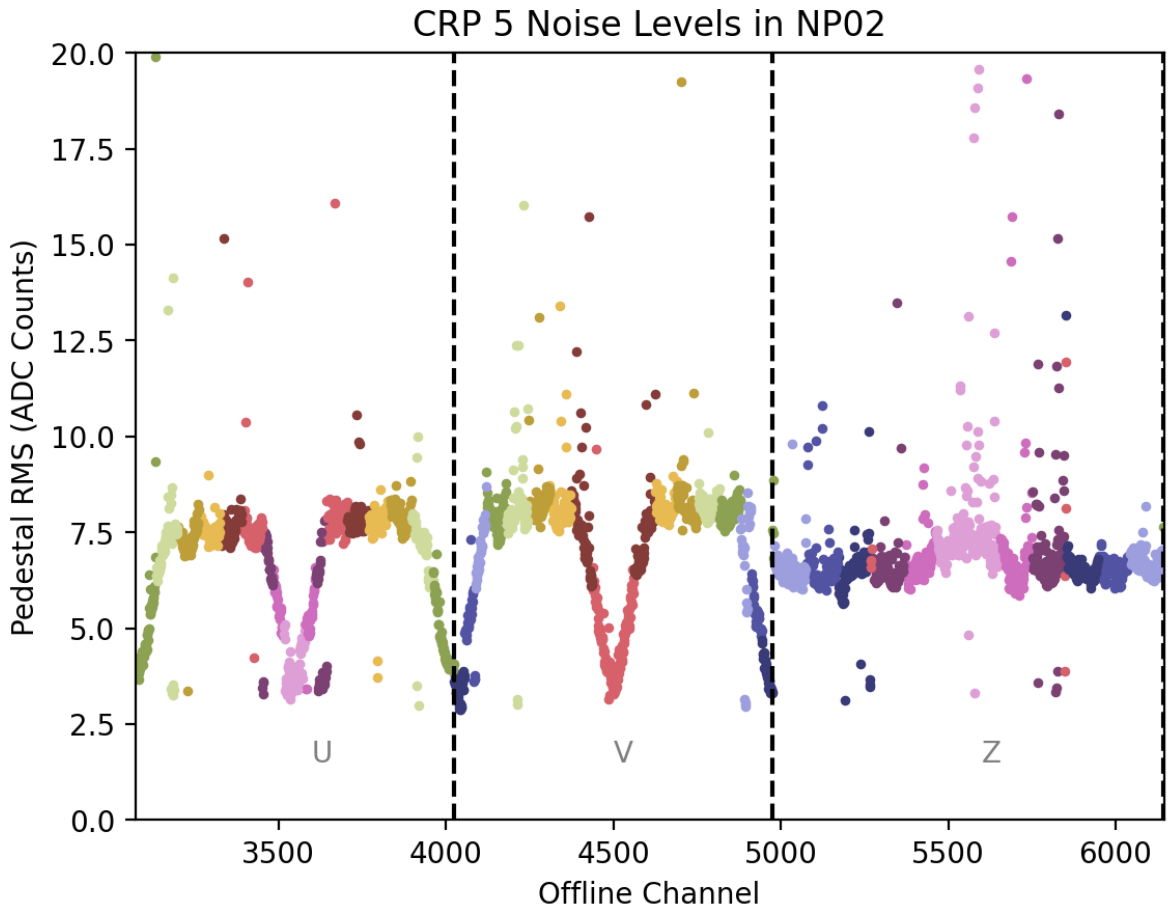
During Transfer (Run 32987 from Saturday 12/07 ~9:41 PM CERN)



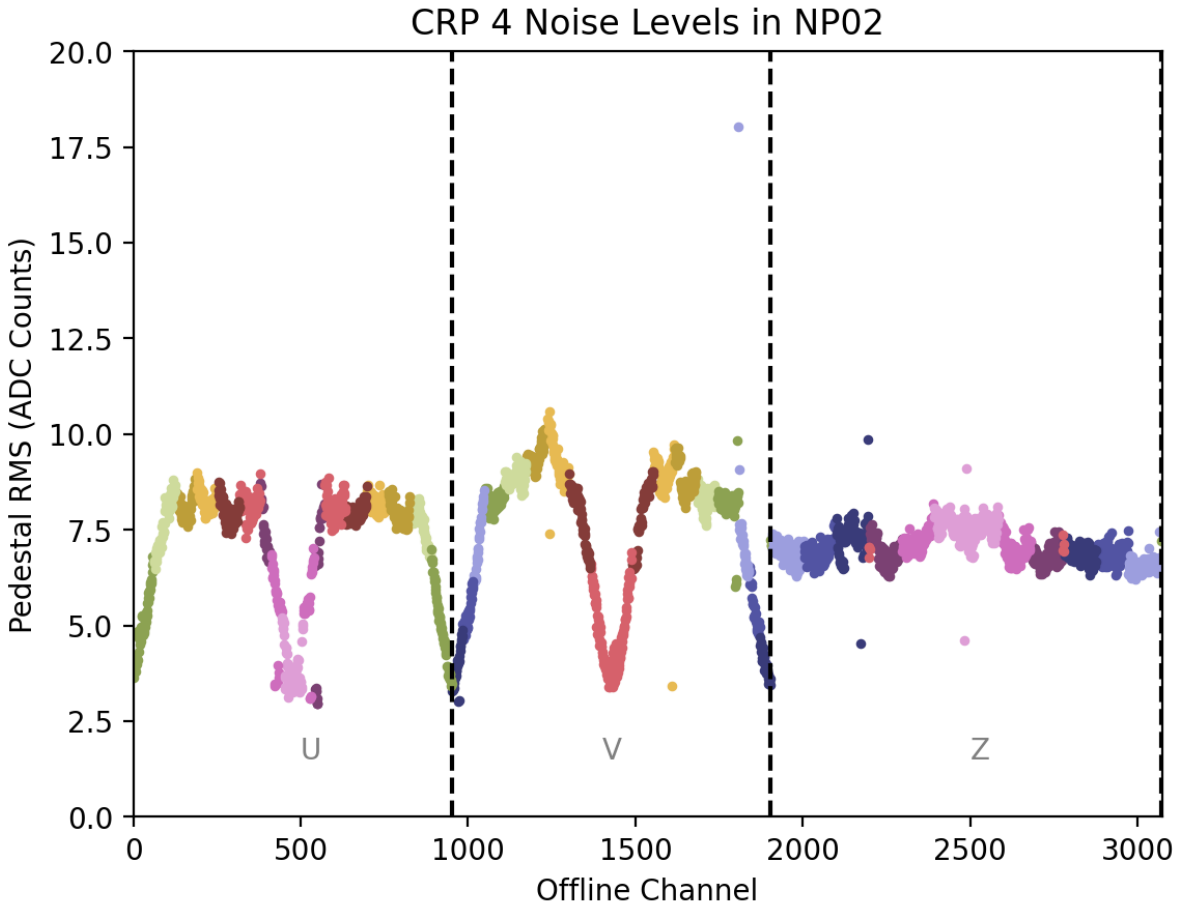


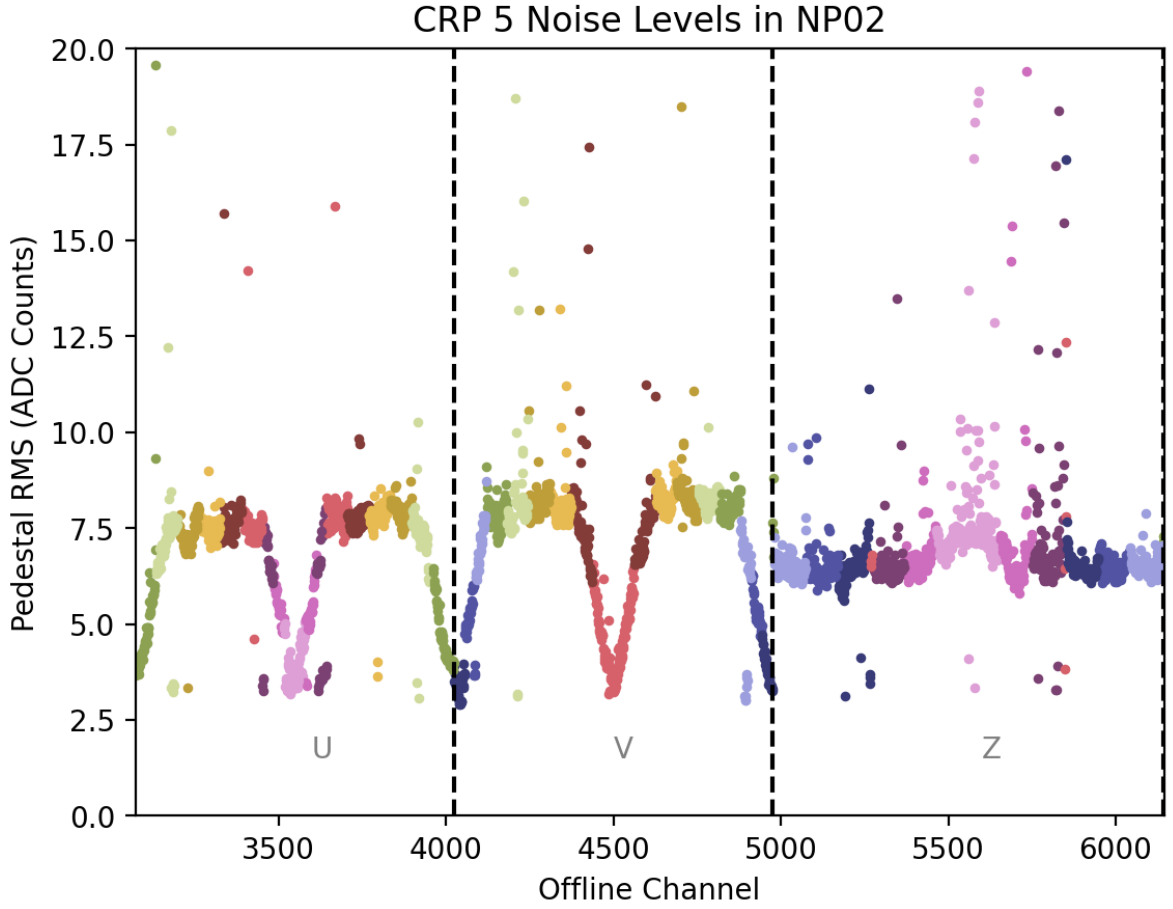
During Transfer (Run 33015 from Sunday 12/08 ~12:09 PM CERN)





During Transfer (Run 33015 from Monday 12/09 ~8:00 AM CERN)

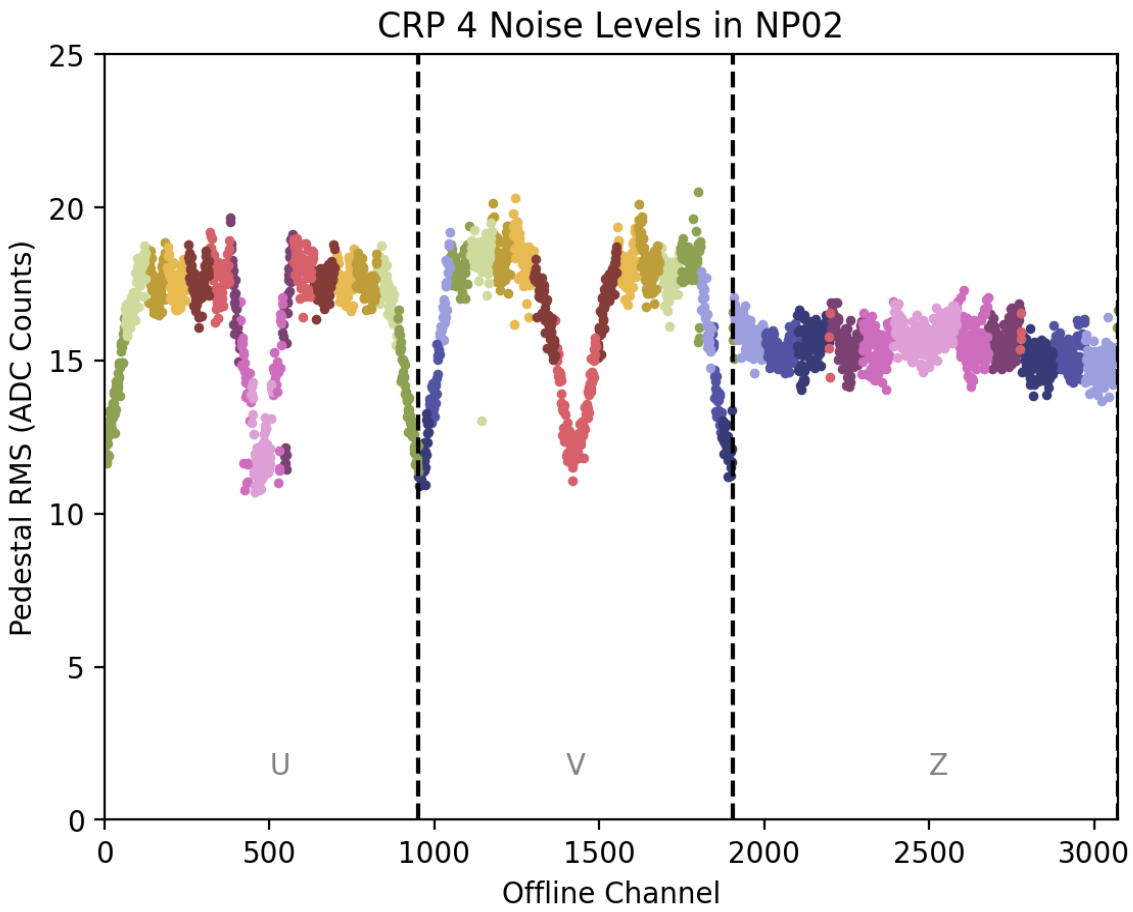




Side by Side Comparisons to the *Before* Case

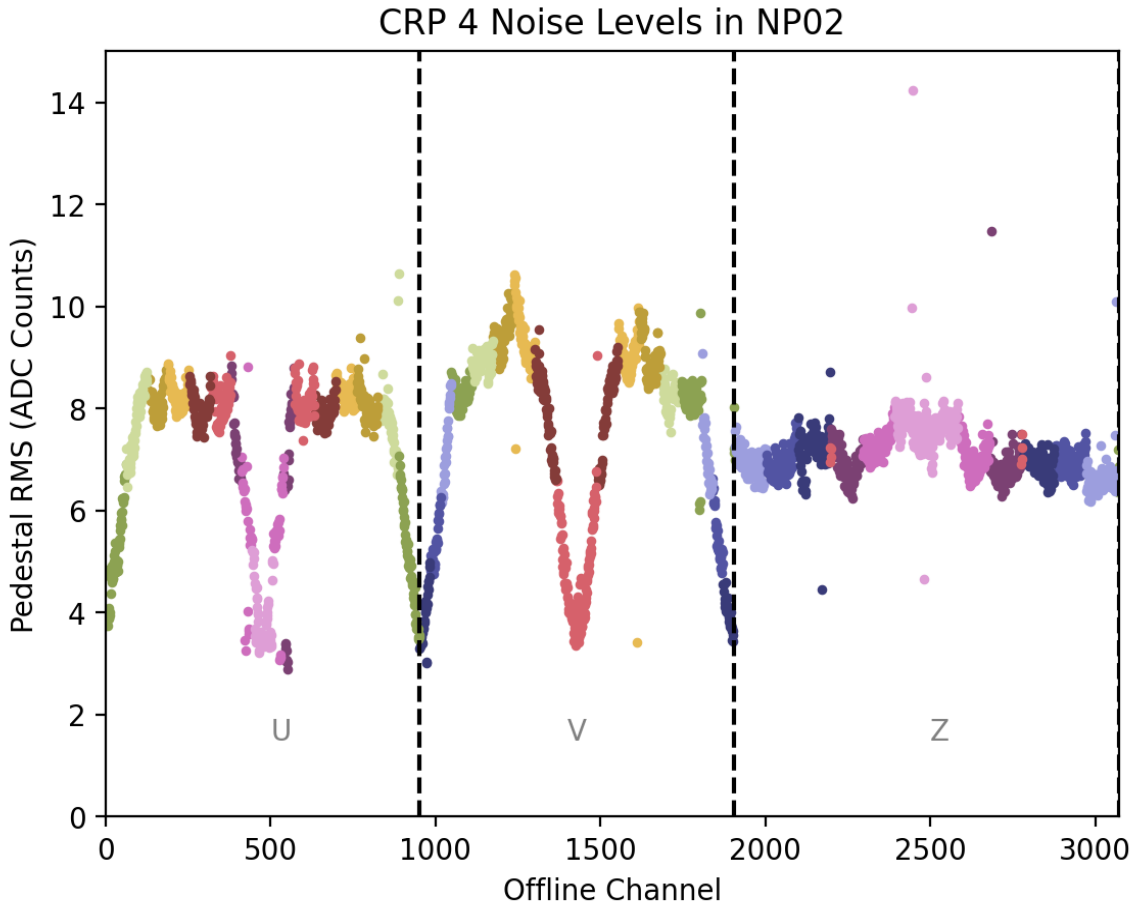
CRP 4

Before Transfer



Run 32962 from 11/18 @ ~9:46 AM CERN

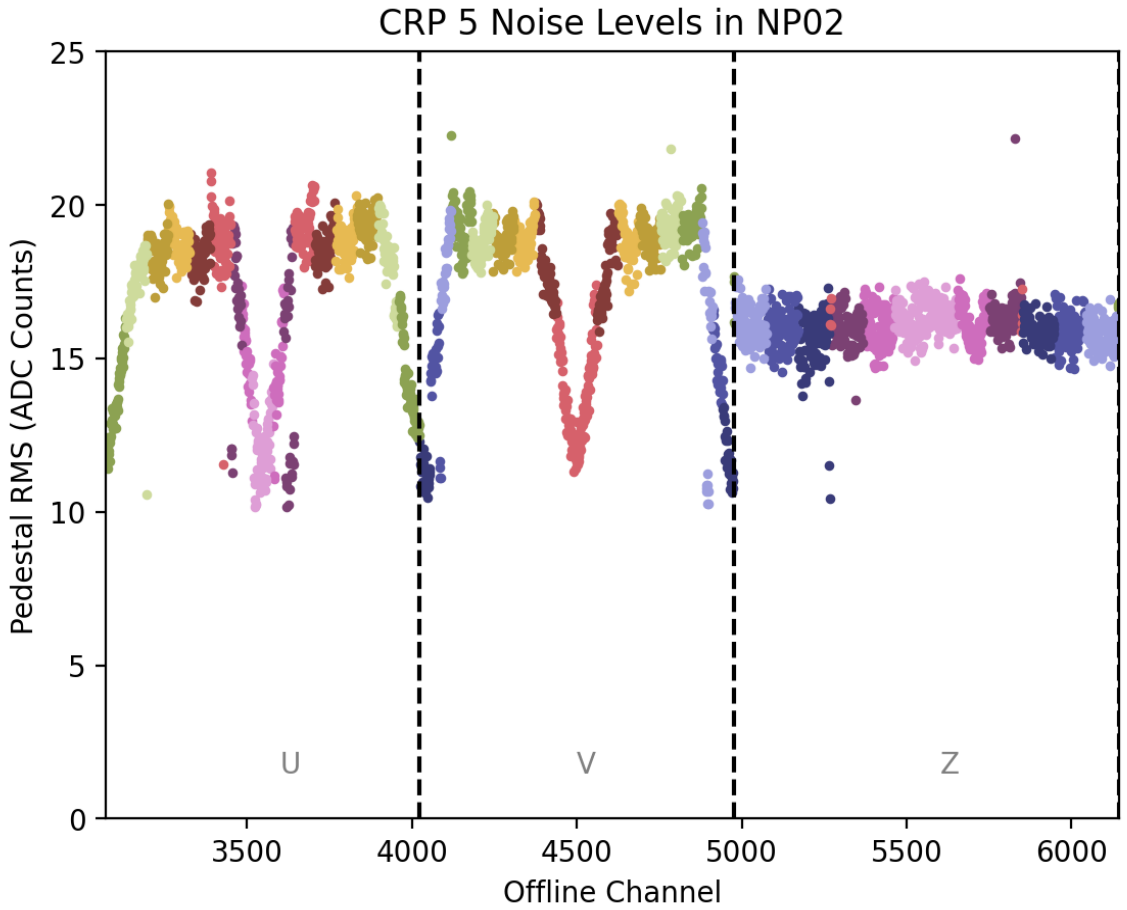
During Transfer



Run 32987 from 12/07 ~2:41 PM CERN

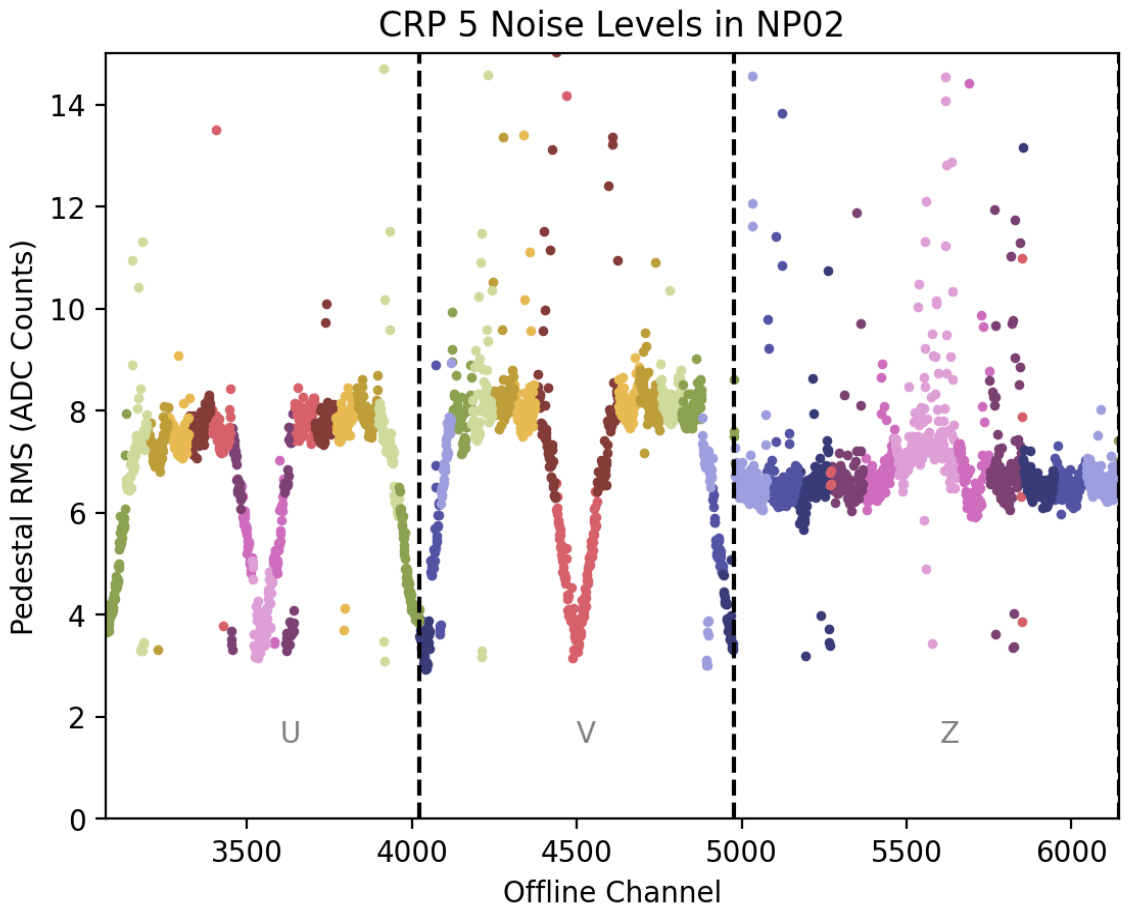
CRP 5

Before Transfer



Run 32962 from 11/18 @ ~9:46 AM CERN

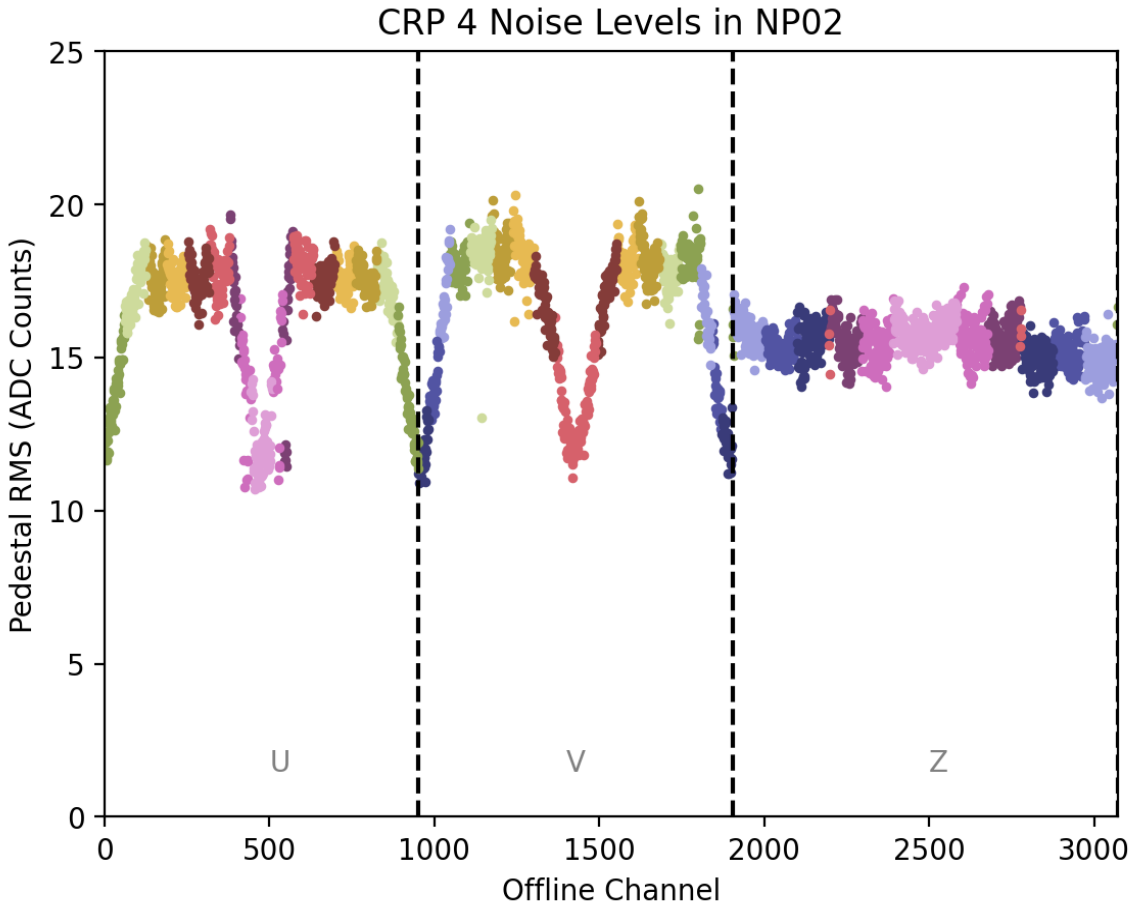
During Transfer



Run 32987 from 12/07 ~2:41 PM CERN

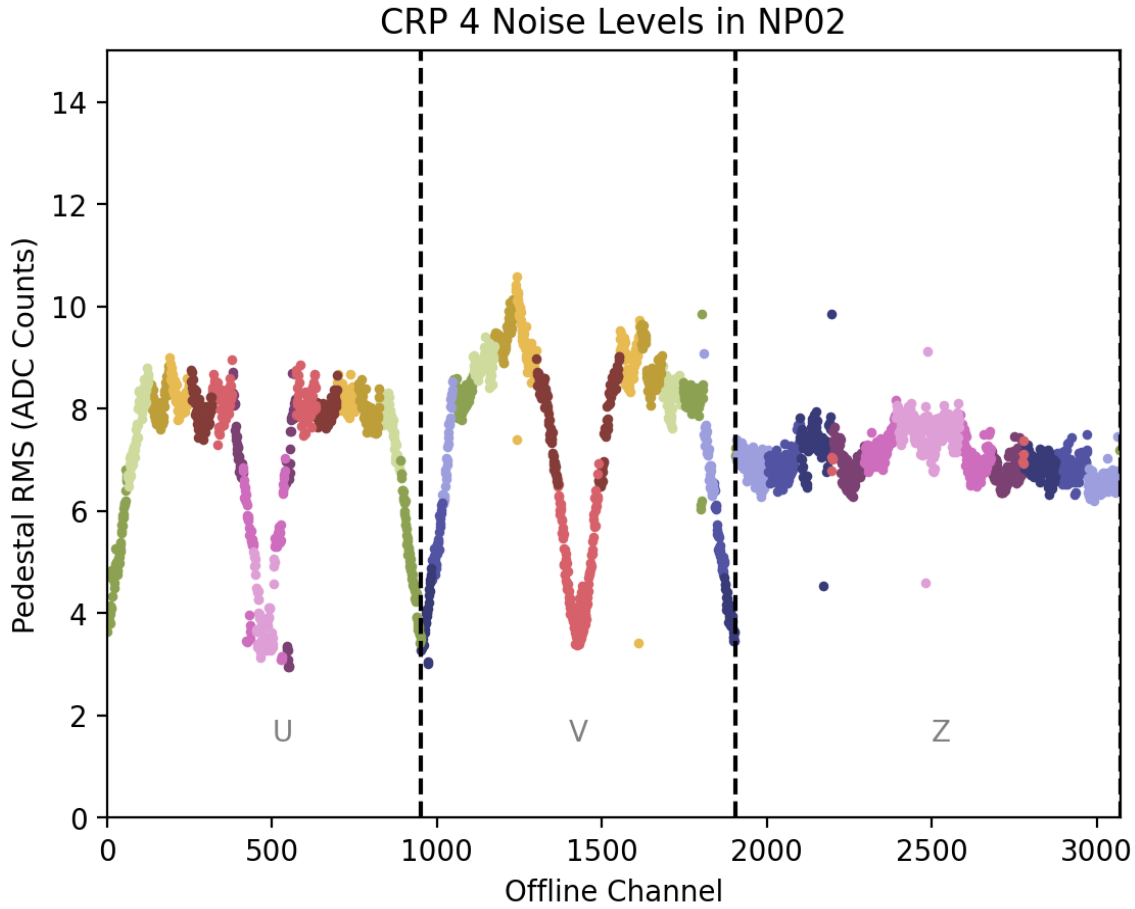
CRP 4

Before Transfer



Run 32962 from 11/18 @ ~9:46 AM CERN

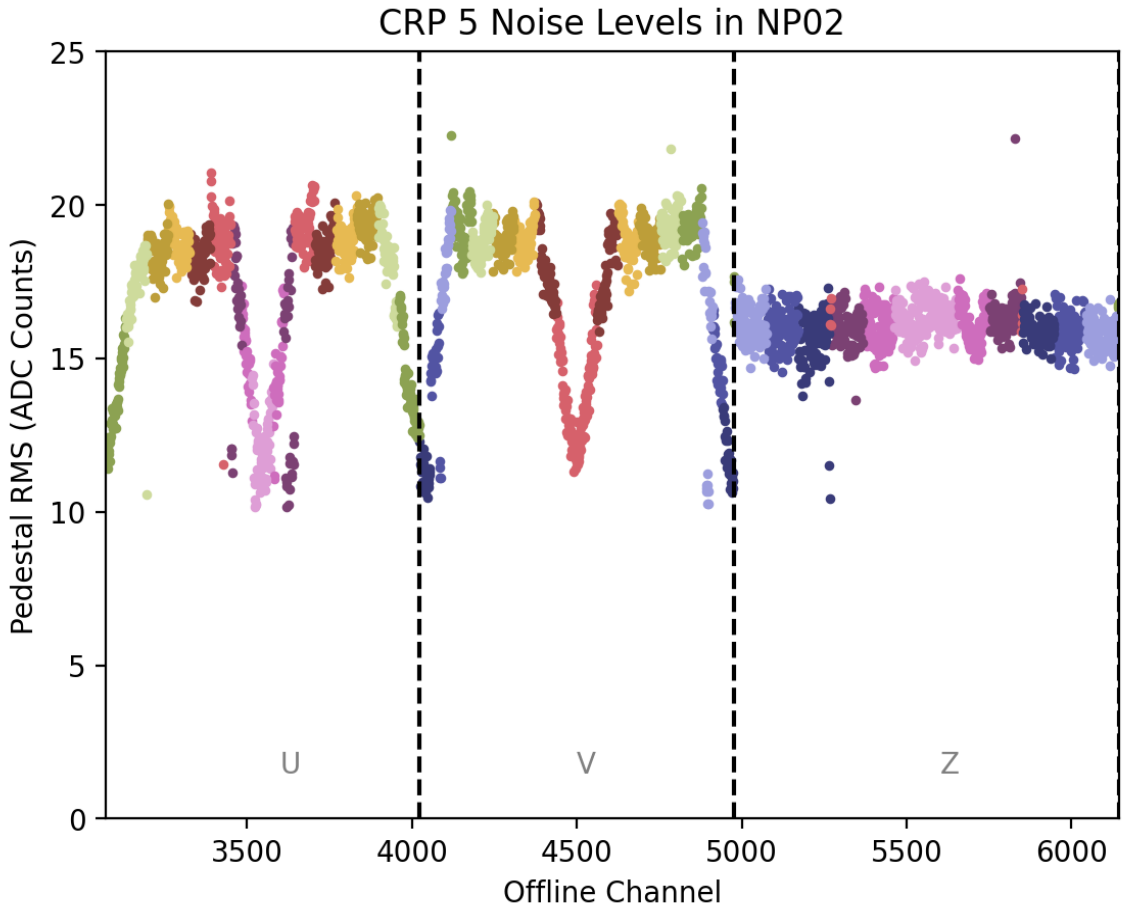
During Transfer



Run 30015 from 12/09 ~7:57 AM CERN

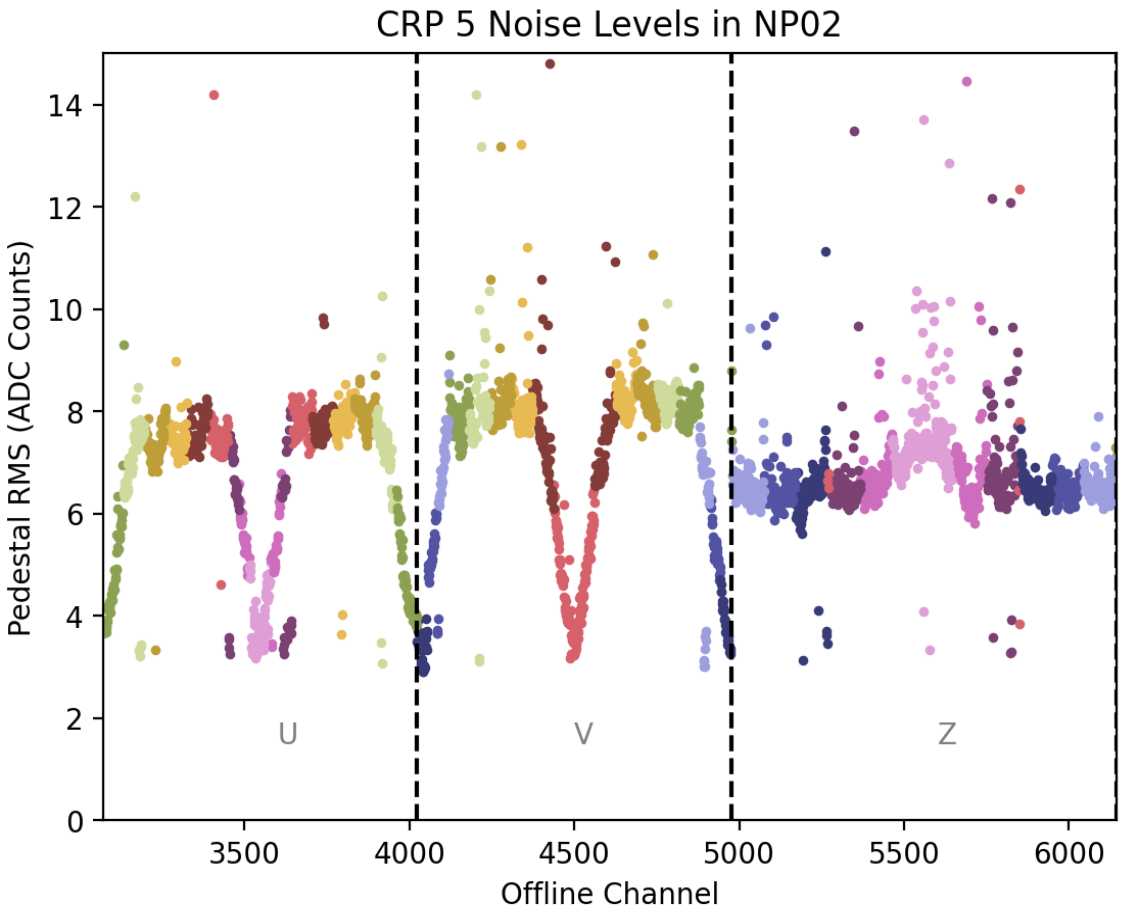
CRP 5

Before Transfer



Run 32962 from 11/18 @ ~9:46 AM CERN

During Transfer

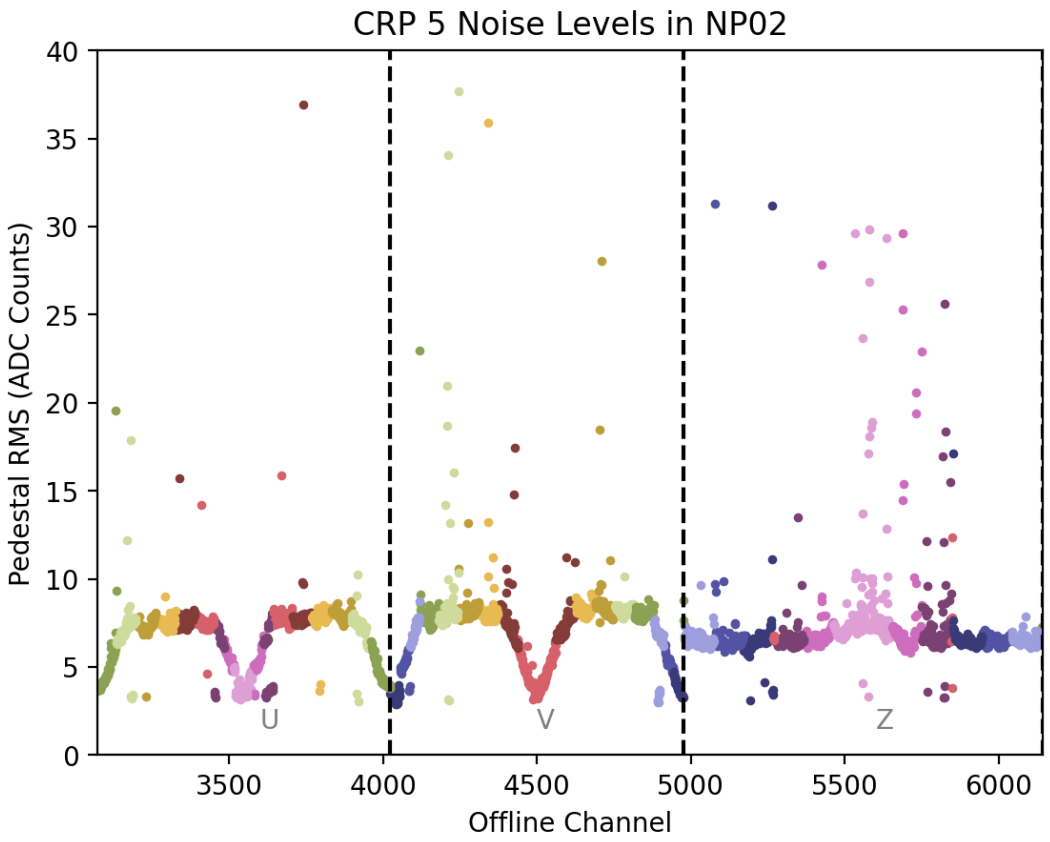


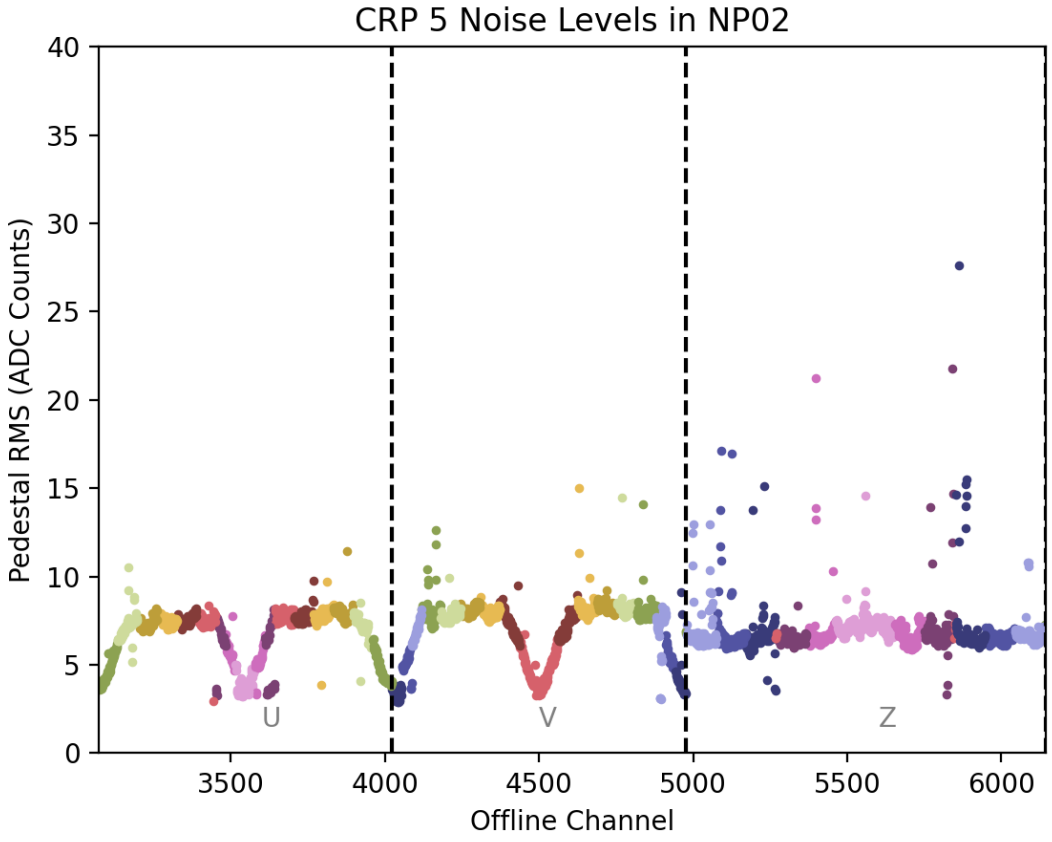
Run 30015 from 12/09 ~7:57 AM CERN

On 12/09, CRPs were biased to nominal voltage

CRP 5

Bias ON





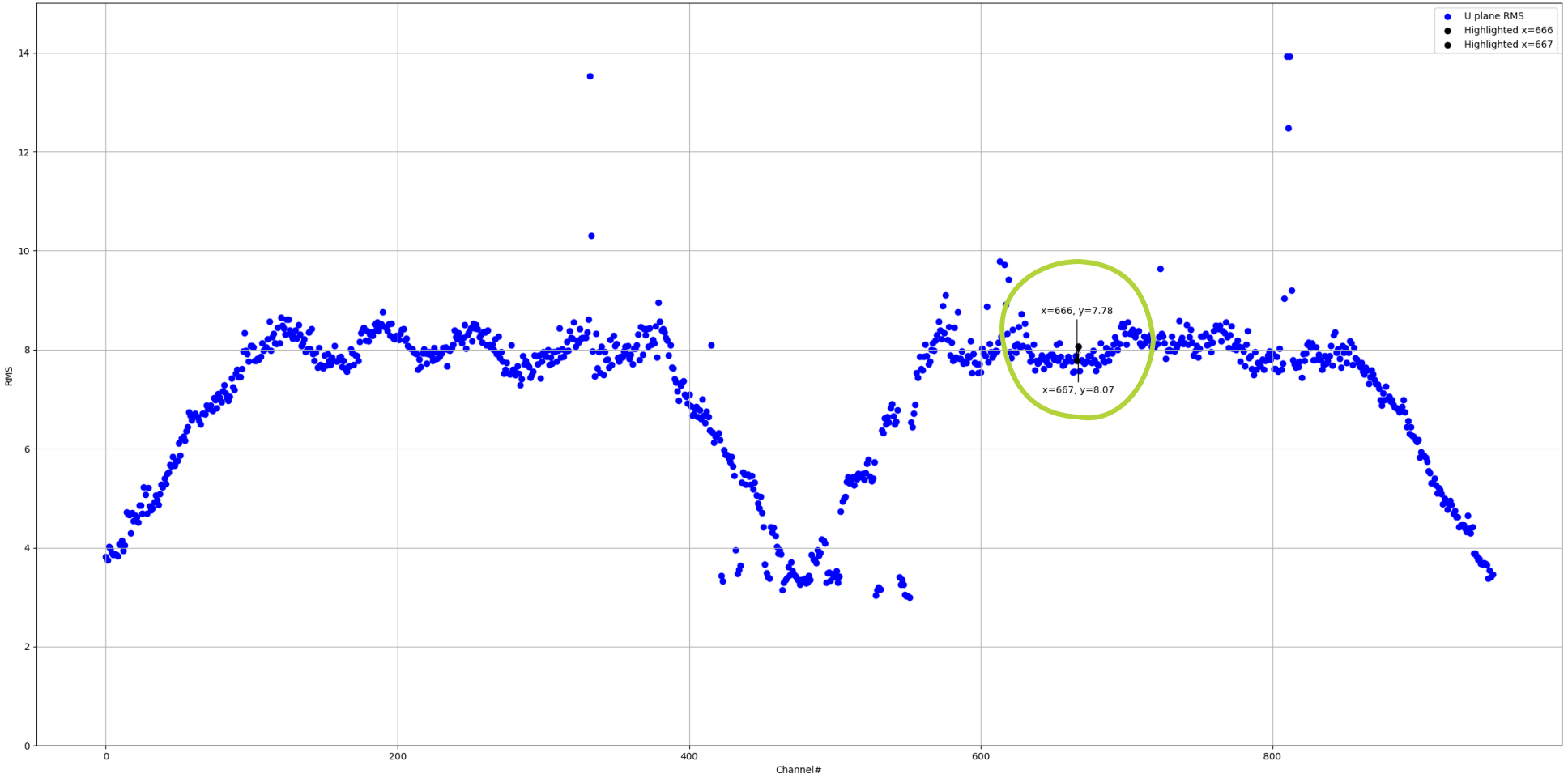
Run 33015 from 12/09 @ ~7:57 AM CERN

Run 33233 from 12/09 @ ~11:57 PM CERN

More bias testing went on during 12/10

There are new dead channels

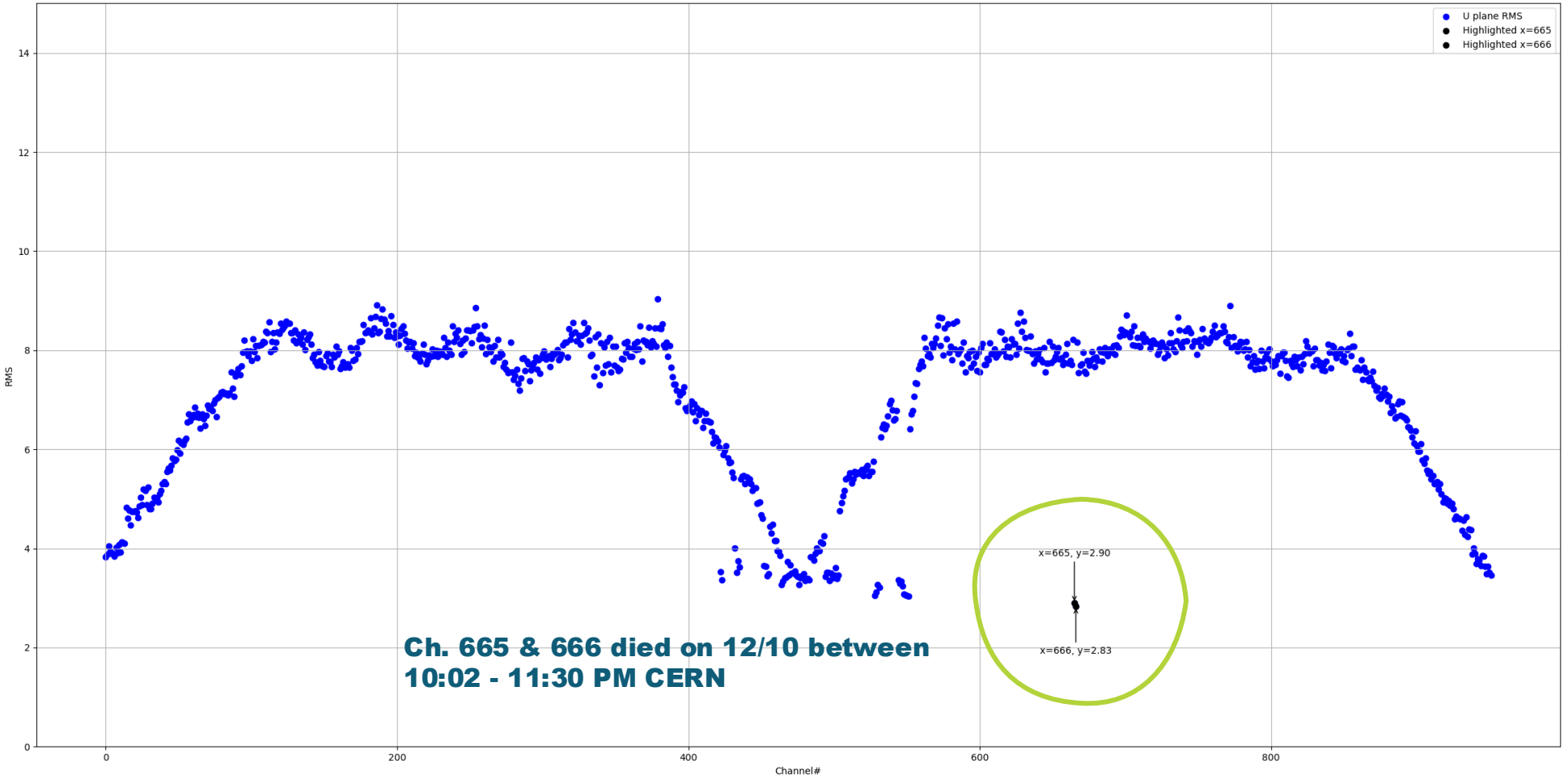
CRP4-U Noise Levels



Run 33412 from 12/10 @ ~10:02 PM CERN

There are new dead channels

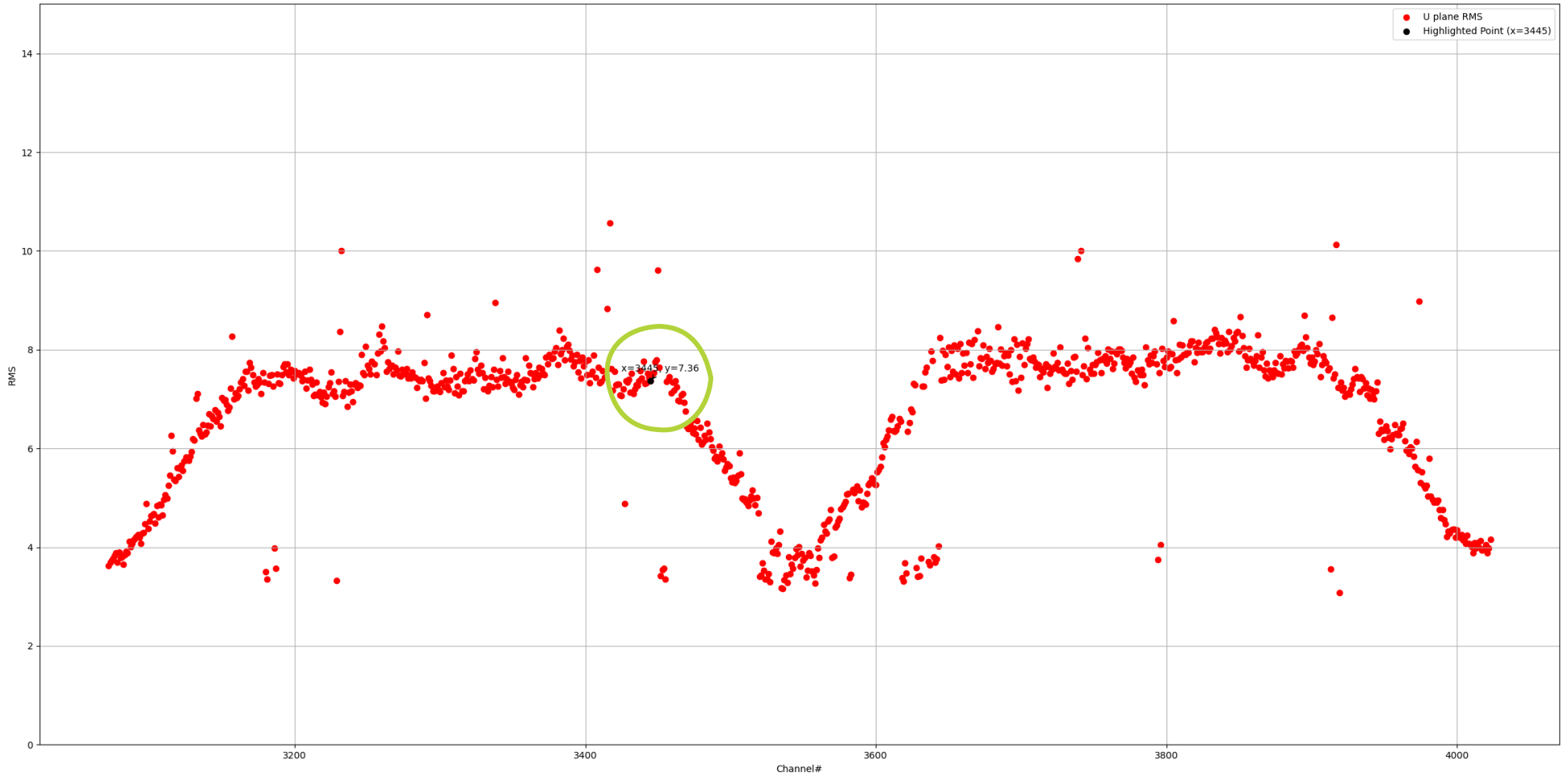
CRP4-U Noise Levels



Run 33446 from 12/10 @ ~11:30 PM CERN

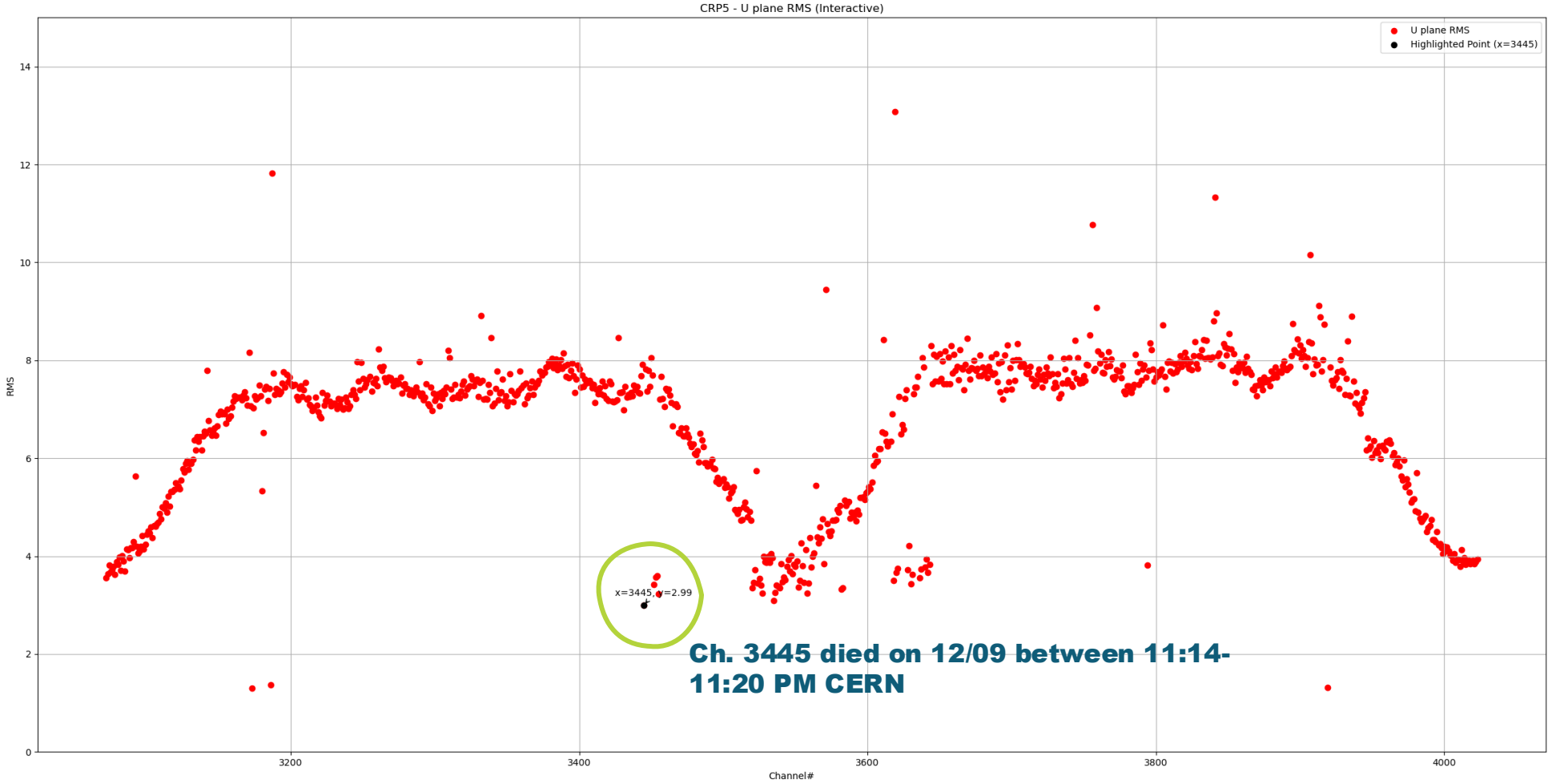
There are new dead channels

CRP5-U Noise Levels



Run 33041 from 12/09 @ ~23:14 PM CERN

There are new dead channels



Ch. 3445 died on 12/09 between 11:14-11:20 PM CERN

Run 33041 from 12/09 @ ~23:20 PM CERN

Conclusions

- **It seems like we have two new very high-noise channels (1646 & 1647).**
- **Overall noise decreased (expected).**

- **Outliers (both high and low noise) are being tracked.**
  - **Understand the nature of the high noise channels that came with the LAr transfer.**
  - **To see if more *dead* channels appear (they did!).**