

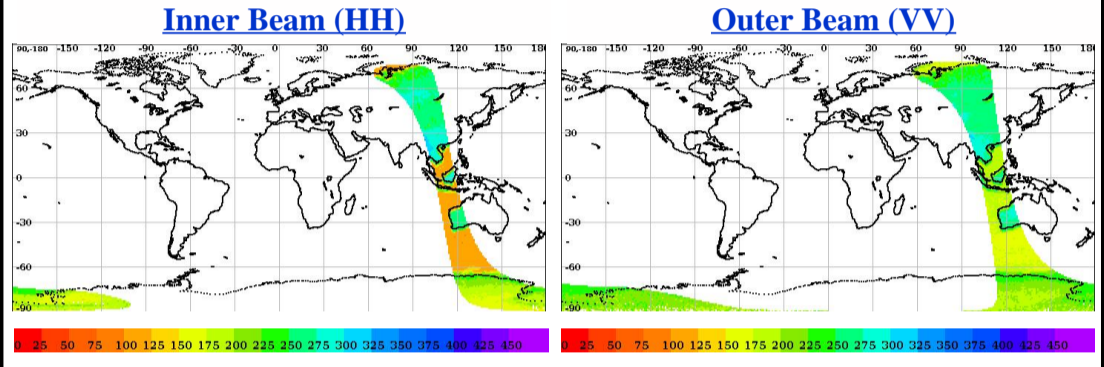
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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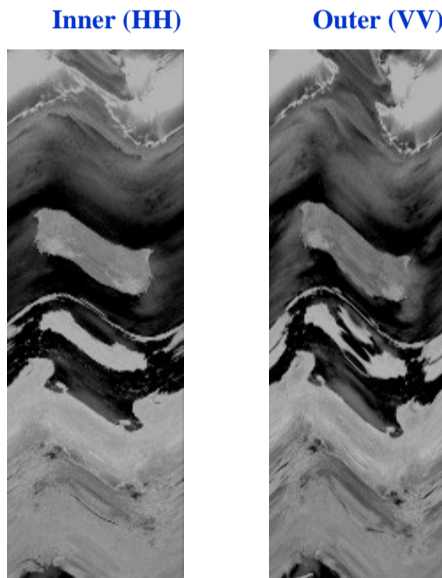
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	16041	<b>Total Scans</b>	916
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	16042	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	16041_16042	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	07-10-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	07-10-2019	<b>Equator Crossing Time</b>	13:03:37.000	<b>No Of Outer Slices</b>	15

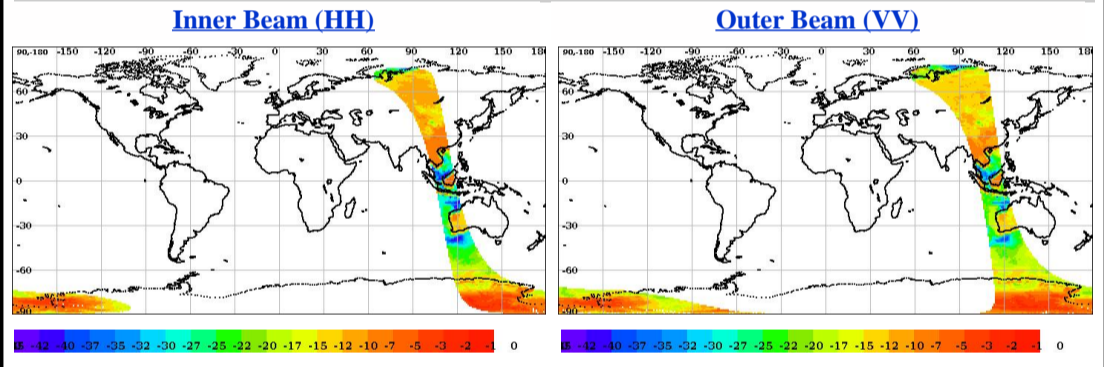
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



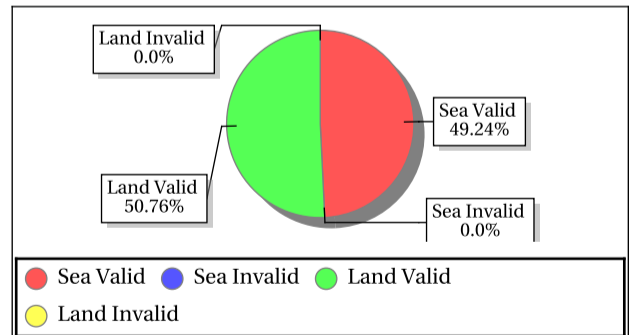
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.00	0.02
Data Not Available From Payload (%)	0.0	0.0
Slice not within sample array limits (%)	0.00	100.00
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.23	13.34
Noise samples for blending Saturated	0.0	0.0
Count samp. for interpol. saturated (%)	0.00	0.00
Sigma0 < lower bound (-96dB) (%)	0.0	0.0
Sigma0 > upper bound (0 dB) (%)	0.00	0.00
SNR < -65 dB (%)	0.033598	0.067904

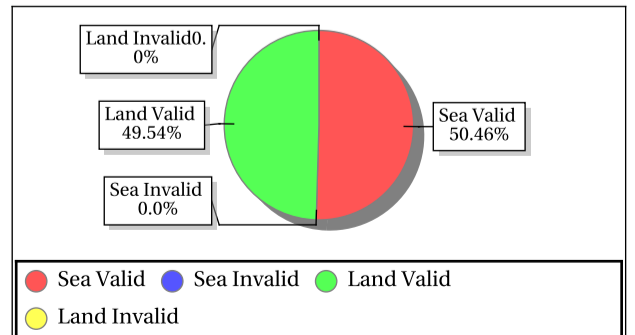
\*DP Format Document

## Sigma-0 Quality Flag Statistics for Inner/Outer Footprints

### Inner Beam (HH)



### Outer Beam (VV)



## Invariant Site Sigma-0 Statistics for Ascending/Descending, Fore/Aft in HH/VV beams

Site Name	Center Lat	Center Lon	Beam	Node	ScanDir	Sigma0 Min	Sigma0 Max	Sigma0 Mean	Sigma0 Std	BT Min	BT Max	BT Mean	BT Std
ANT_1	-75.00	121.00	Inner	ASC	Aft	-8.68	-6.65	-7.65	0.64	146.46	190.21	175.16	12.53
ANT_1	-75.00	121.00	Inner	ASC	Fore	-8.67	-6.34	-7.37	0.60	161.26	214.85	189.30	15.76
Australia	-23.00	118.00	Inner	ASC	Aft	-12.18	-7.73	-9.23	0.89	229.04	318.20	277.97	16.90
Australia	-23.00	118.00	Inner	ASC	Fore	-11.03	-7.38	-8.71	0.87	239.85	314.97	277.83	16.14
ANT_1	-75.00	121.00	Outer	ASC	Aft	-9.46	-7.00	-8.24	0.86	189.38	238.04	207.92	16.18
ANT_1	-75.00	121.00	Outer	ASC	Fore	-9.52	-6.92	-8.04	0.76	186.23	215.76	198.95	8.42
Australia	-23.00	118.00	Outer	ASC	Aft	-12.69	-9.57	-10.73	0.75	248.93	318.46	281.13	17.16
Australia	-23.00	118.00	Outer	ASC	Fore	-12.57	-8.89	-10.31	0.84	243.92	306.42	276.50	16.75



## Overall statistics for the Static Parameters (Footprint-wise)

Inner Beam (HH)																
	Sea Aft				Sea Fore				Land Aft				Land fore			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
<b>Kp</b>	0.12	261.98	0.47	4.852	0.12	227.79	0.43	4.576	0.12	0.62	0.12	0.000	0.12	0.35	0.12	0.000
<b>Kpa</b>	0.01	0.02	0.01	0.000	0.01	0.02	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
<b>Kpb</b>	0.02	0.02	0.02	0.000	0.02	0.02	0.02	0.000	0.02	0.02	0.02	0.000	0.02	0.02	0.02	0.000
<b>Kpc</b>	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
<b>SNR</b>	-34.32	23.15	3.94	0.007	-33.71	23.85	4.62	0.016	-7.35	29.83	18.42	12.809	-4.10	31.56	18.77	15.173

Outer Beam (VV)																
	Sea Aft				Sea Fore				Land Aft				Land fore			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
<b>Kp</b>	0.09	178.63	0.36	3.763	0.09	216.12	0.36	3.659	0.09	0.47	0.09	0.000	0.09	0.40	0.09	0.000
<b>Kpa</b>	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
<b>Kpb</b>	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
<b>Kpc</b>	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
<b>SNR</b>	-33.82	16.78	1.89	0.000	-34.65	16.72	2.84	0.000	-7.33	22.90	12.54	0.081	-6.48	23.69	12.54	0.357

Parameter Specifications					
Parameter	Kp	Kpa	Kpb	Kpc	SNR
Min	0.00	0.00	0.00	0.00	-65.00
Max	1.00	1.00	1.00	1.00	22.00

- Normal
- Deviations
- Alarming
- High Errors

## Overall statistics for static parameter (Footprint-wise)

	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.71	49.42	49.05	0.000	57.54	58.26	57.93	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	6.45	1.27	1.546	0.0000	295.86	1.27	2.432	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1030.38	1079.07	1049.96	0.000	1207.27	1267.86	1231.45	4.181	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.64	-89.97	-90.48	0.000	-93.00	-92.00	-92.25	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.46	16.02	15.71	0.000	20.43	21.03	20.66	0.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.82	20.52	19.75	0.000	8.85	34.84	19.66	2.000	X-Factor	-100.00	-80.00
									Ac.Distance(Inner)	15.00	20.00
									Ac.Distance(Outer)	15.00	22.00
									Al.Distance(Inner)	15.00	30.00
									Al.Distance(Outer)	10.00	30.00

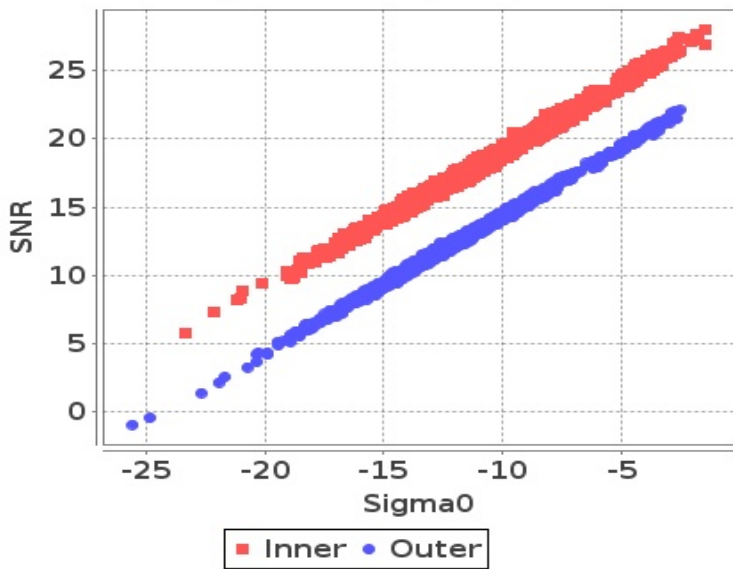
- Normal
- Deviations
- Alarming
- High Errors



# Sigma0 Behaviour (Sigma0 Vs SNR)

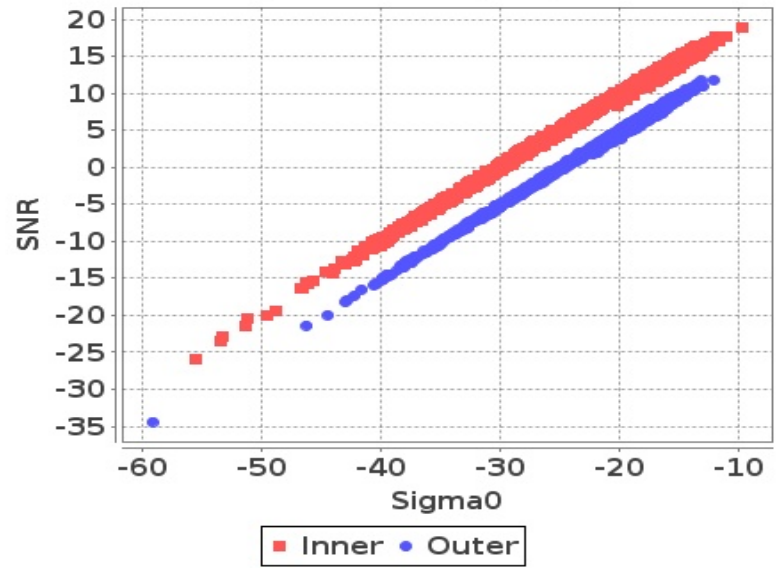
### Footprint-Land

#### Sigma0 Vs SNR (Land)



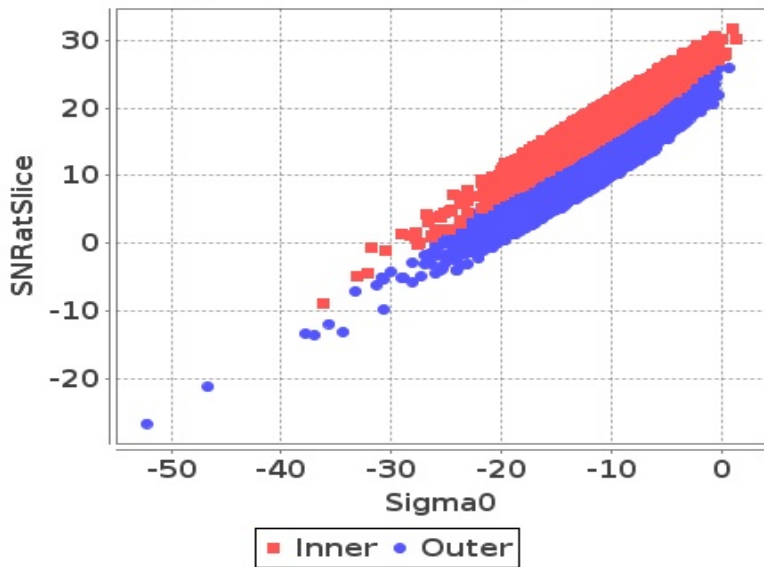
### Footprint-Sea

#### Sigma0 Vs SNR (Sea)



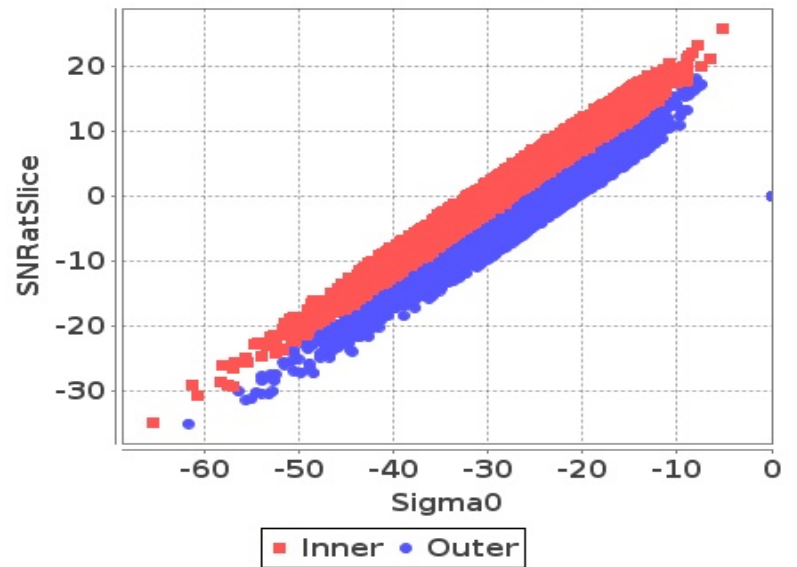
### Slice-Land

#### Sigma0 Vs SNRatSlice (Land)



### Slice-Sea

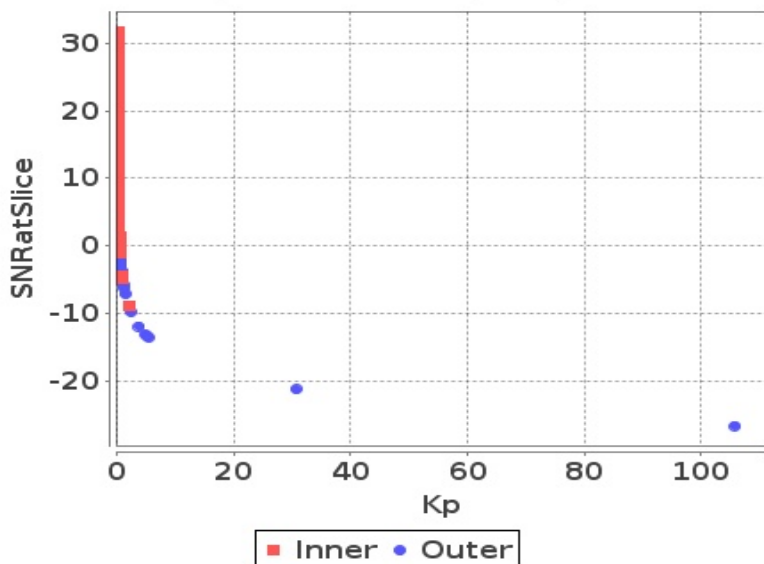
#### Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

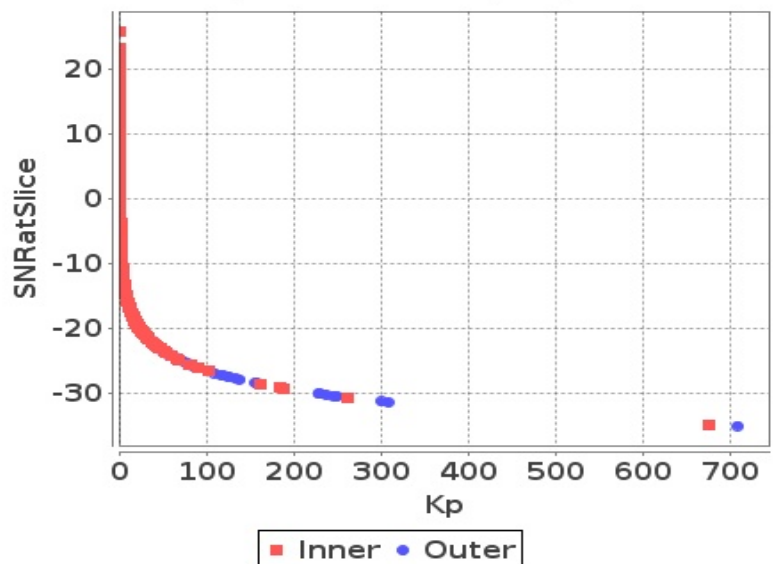
### Slice

#### Kp Vs SNRatSlice (Land)



### Slice

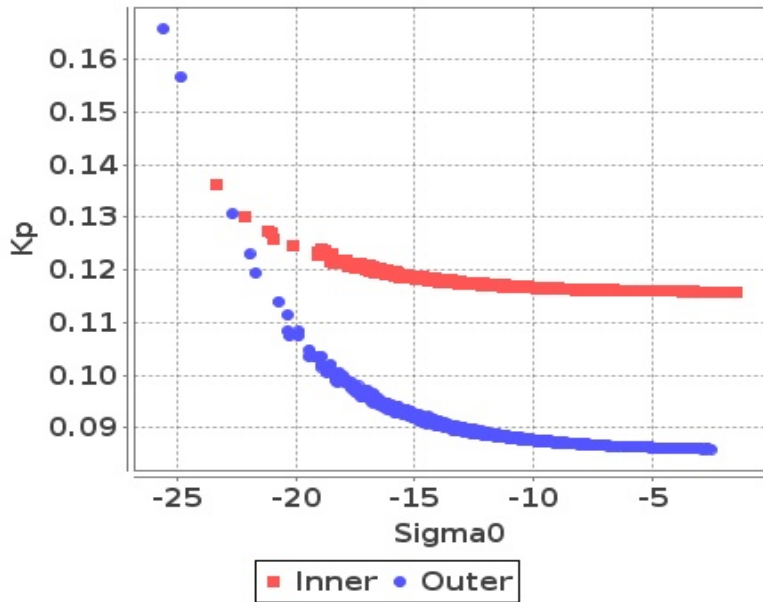
#### Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

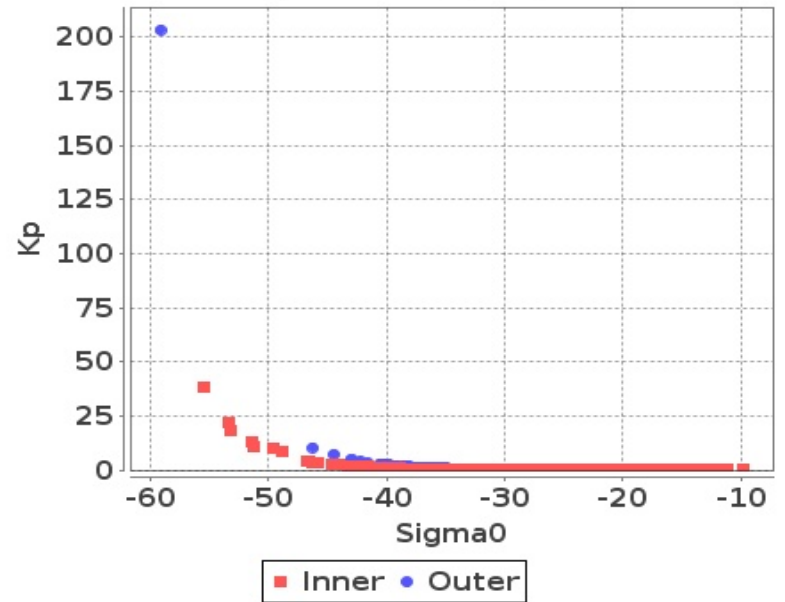
## Footprint-Land

### Sigma0 Vs Kp (Land)



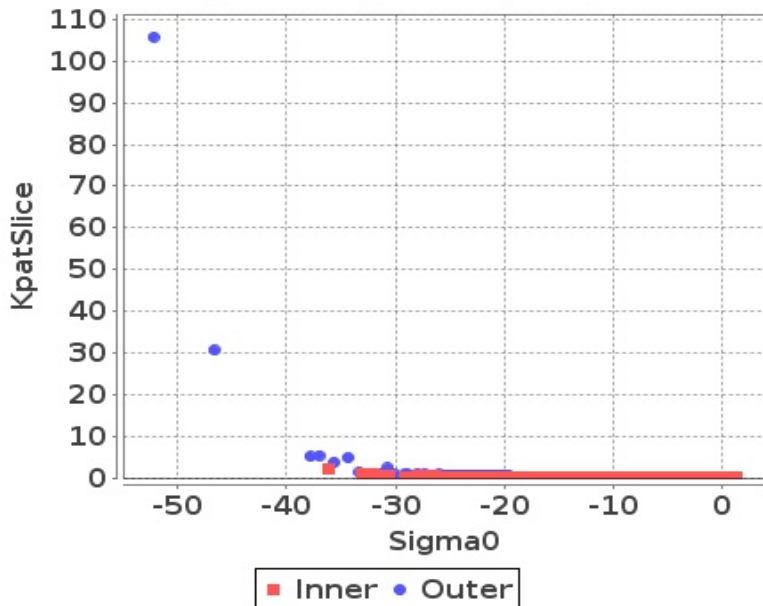
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



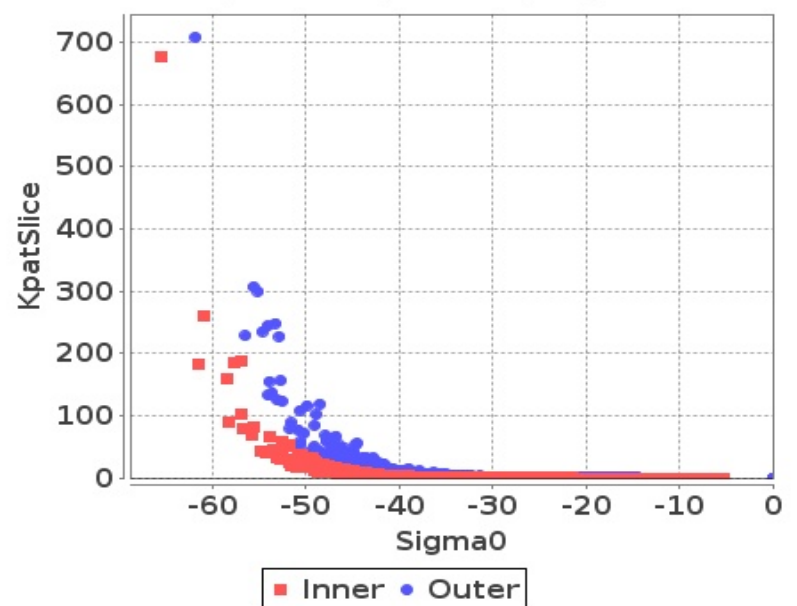
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)



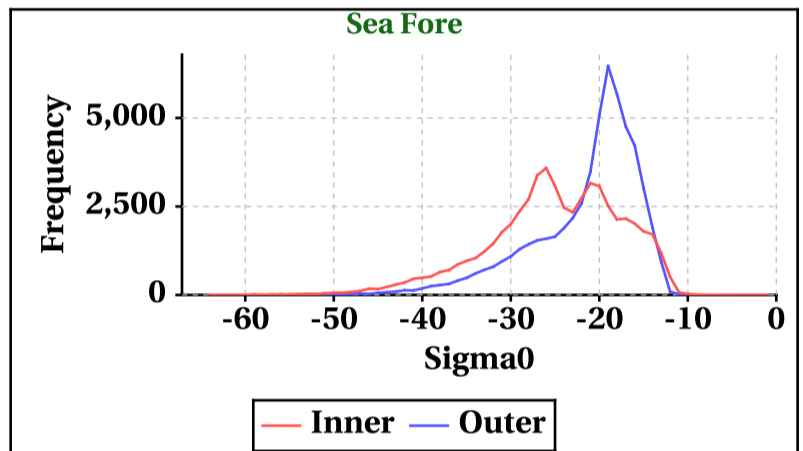
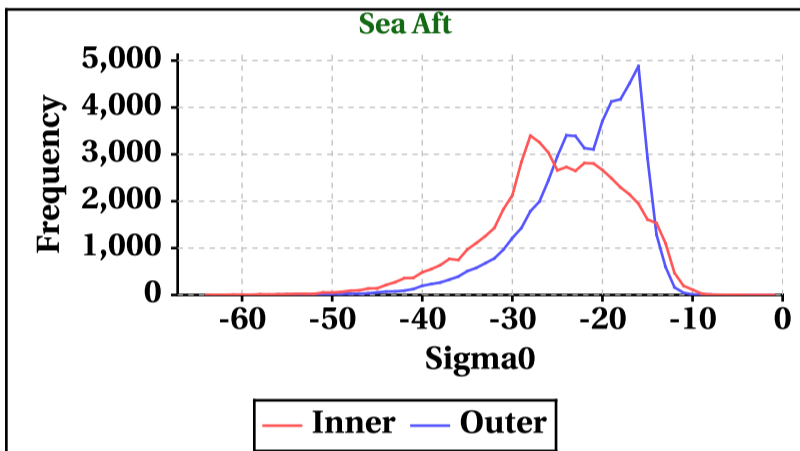
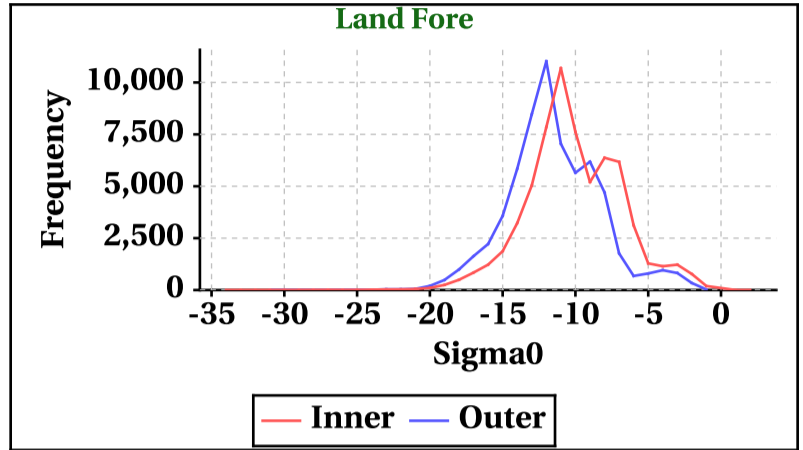
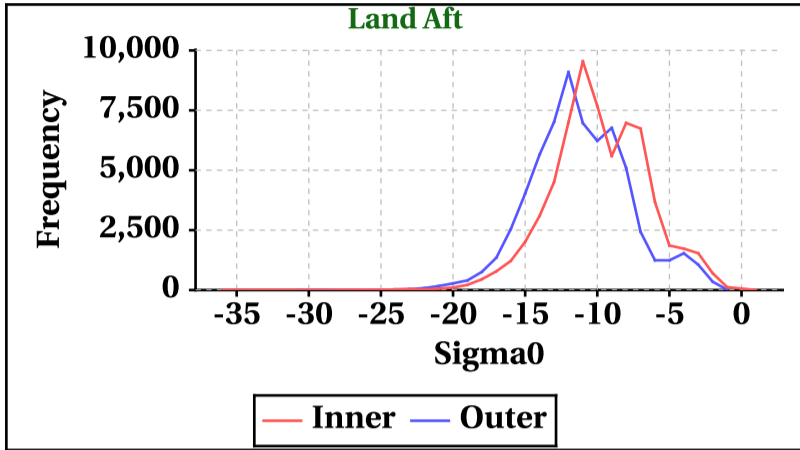


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-36	-34	-64	-64
Max	1	2	0	0

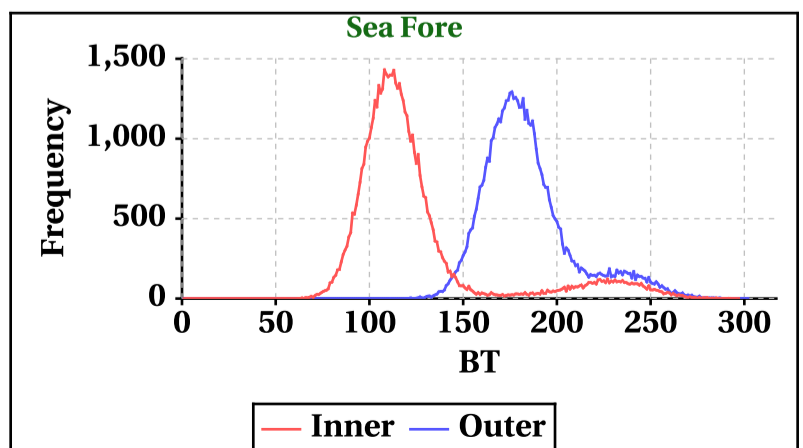
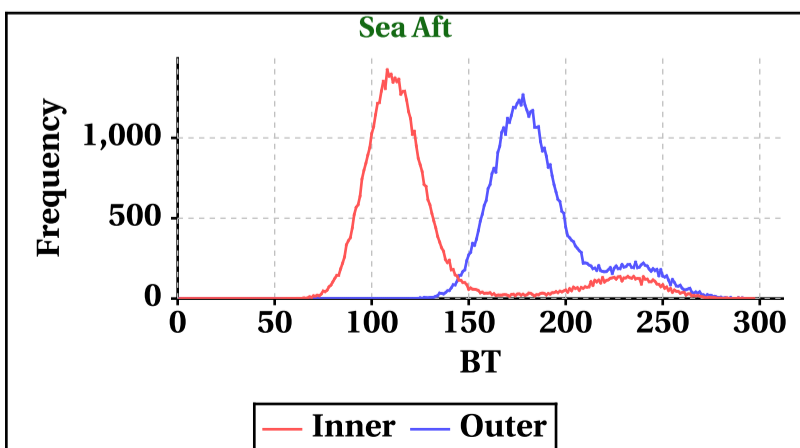
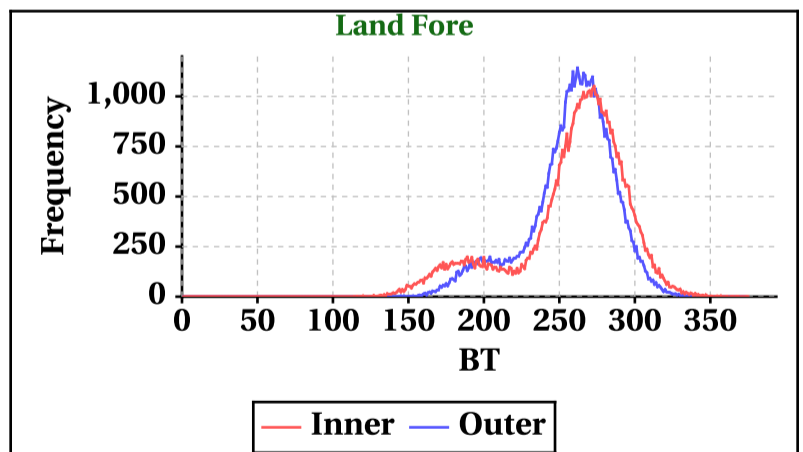
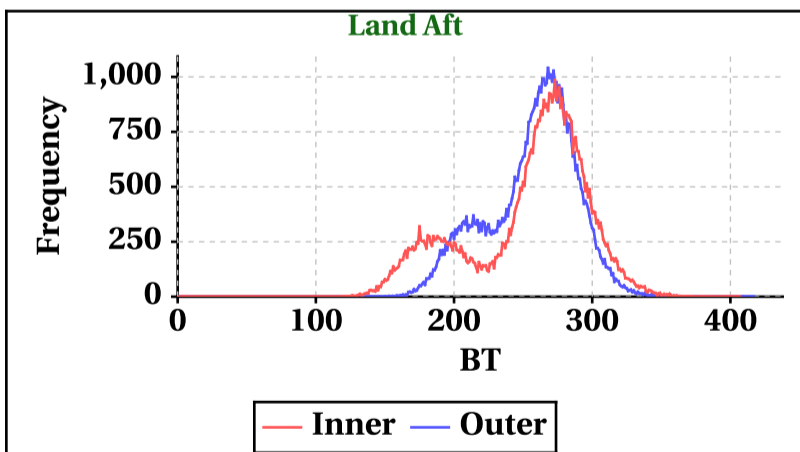
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-31	-31	-58	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	407	375	297	297

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	417	373	292	302

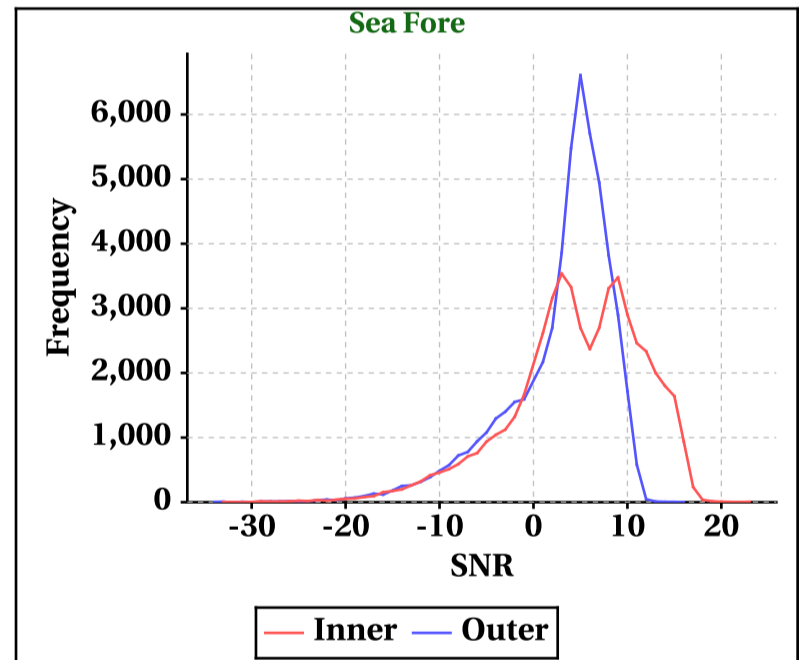
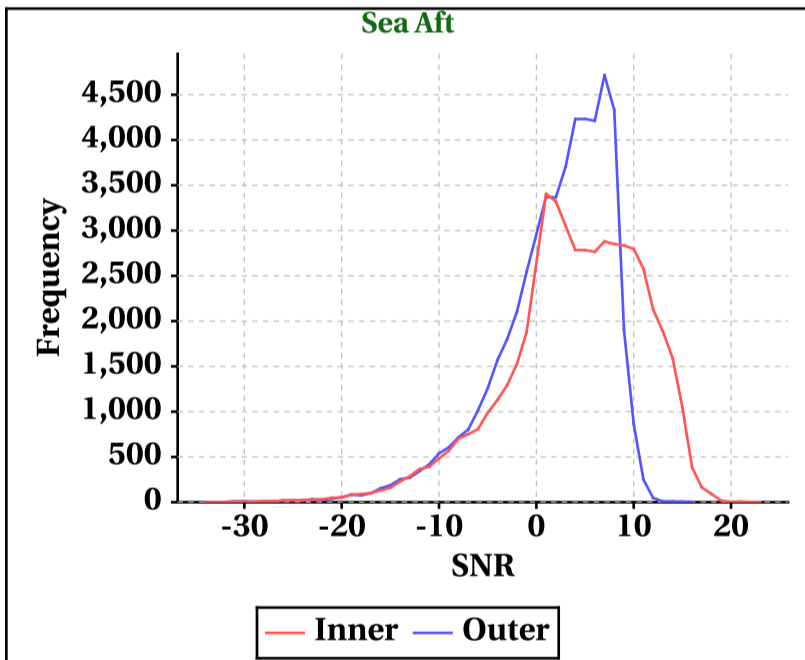
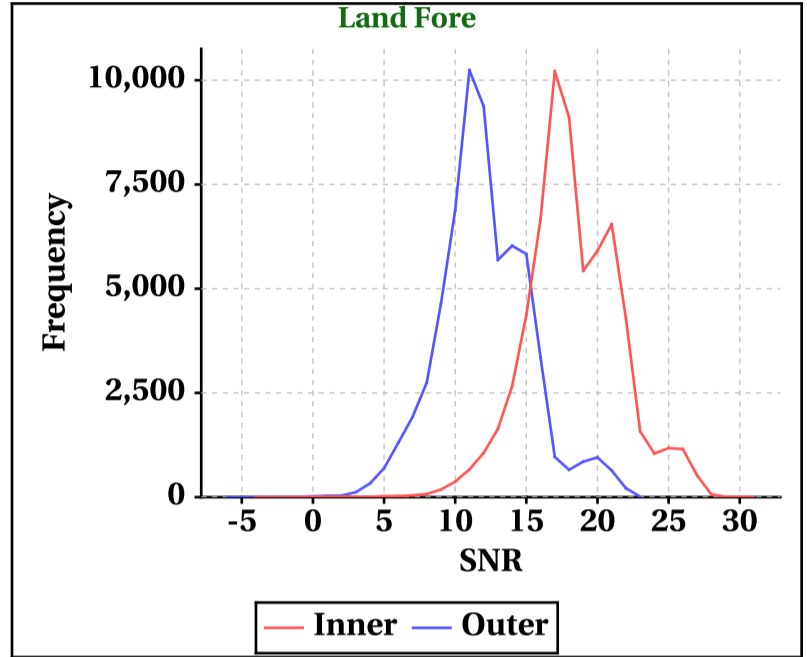
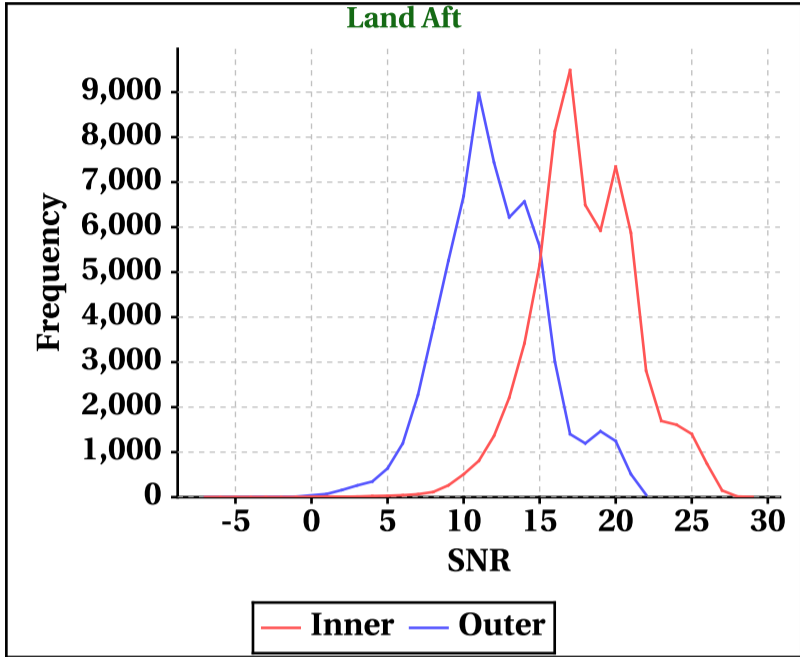


# Dynamic Range (Data Histograms)

## SNR(dBm)

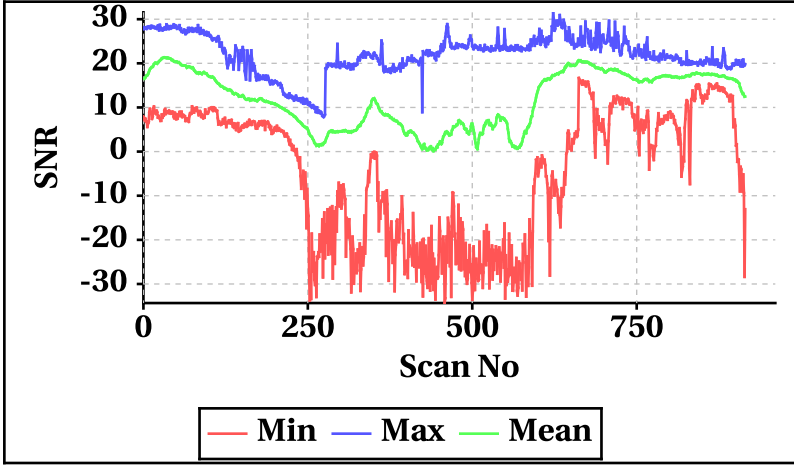
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-7	-4	-34	-33
Max	29	31	23	23

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-7	-6	-33	-34
Max	22	23	16	16

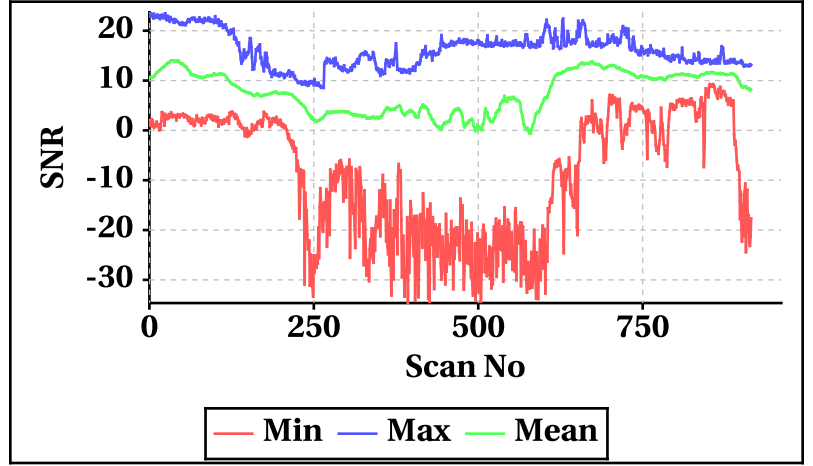


## Orbit-wise behaviour of SNR

**Inner Beam (HH)**

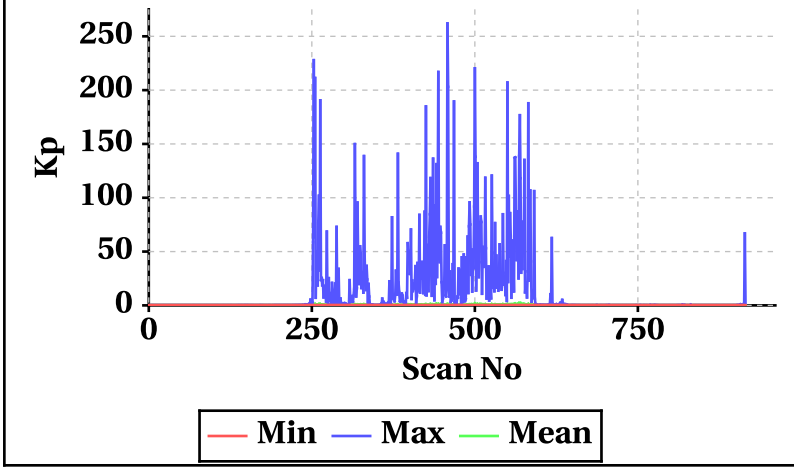


**Outer Beam (VV)**

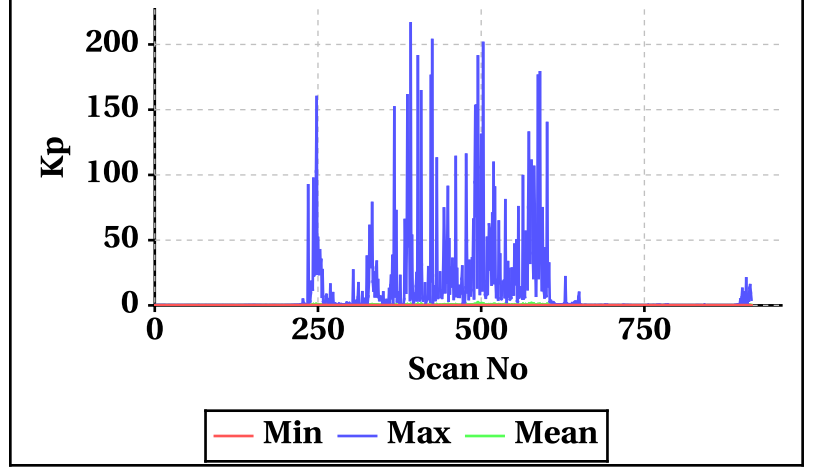


## Orbit-wise behaviour of Kp, Kpa, Kpb, Kpc

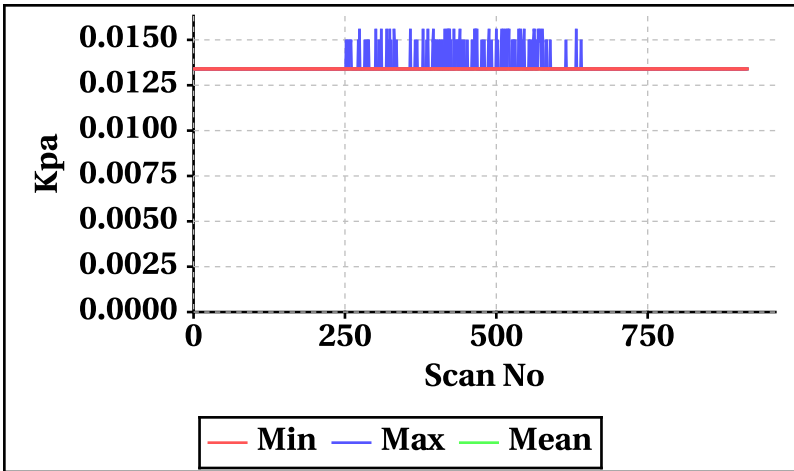
**Inner Beam (HH)**



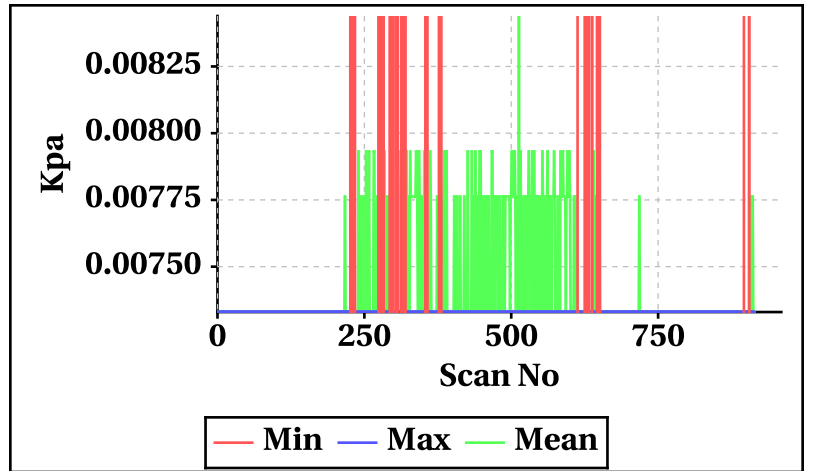
**Outer Beam (VV)**



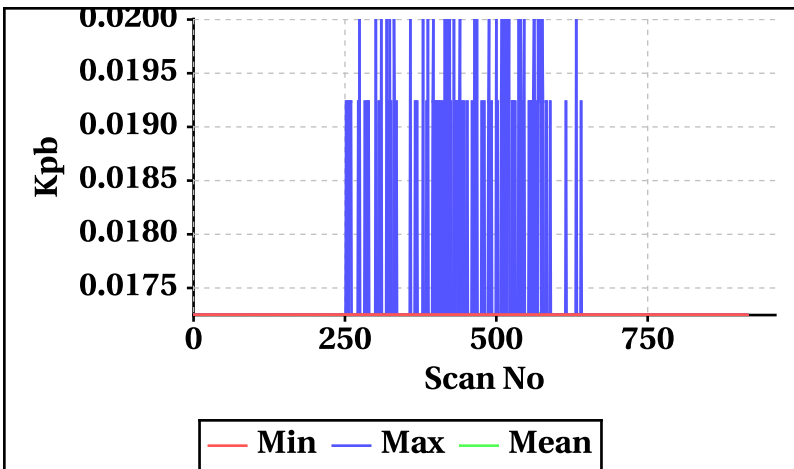
**Inner Beam (HH)**



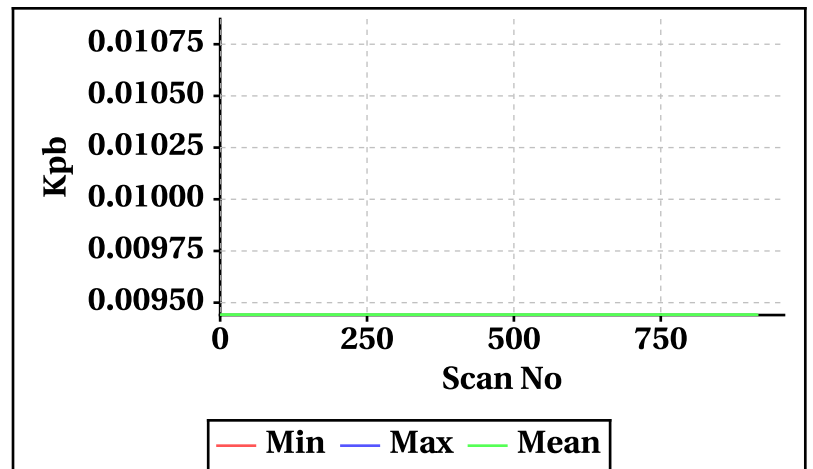
**Outer Beam (VV)**



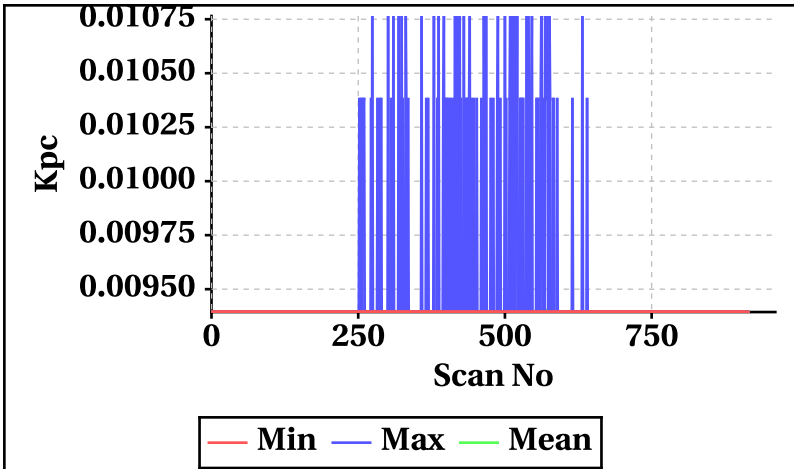
**Inner Beam (HH)**



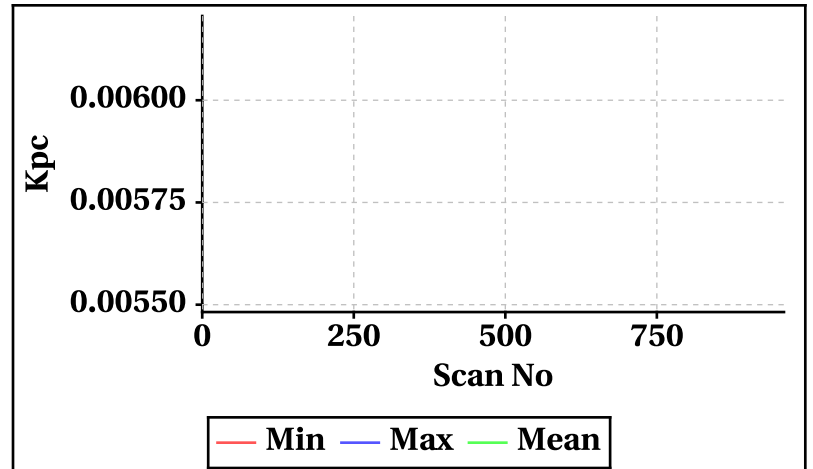
**Outer Beam (VV)**



**Inner Beam (HH)**



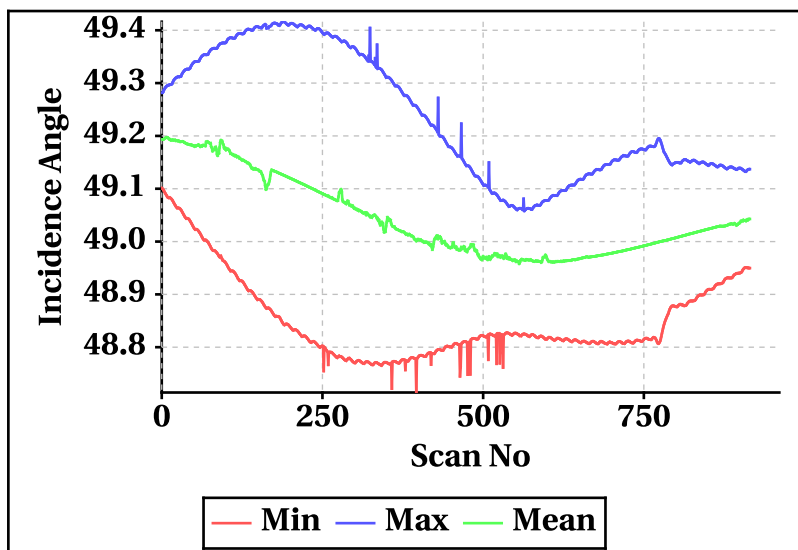
**Outer Beam (VV)**



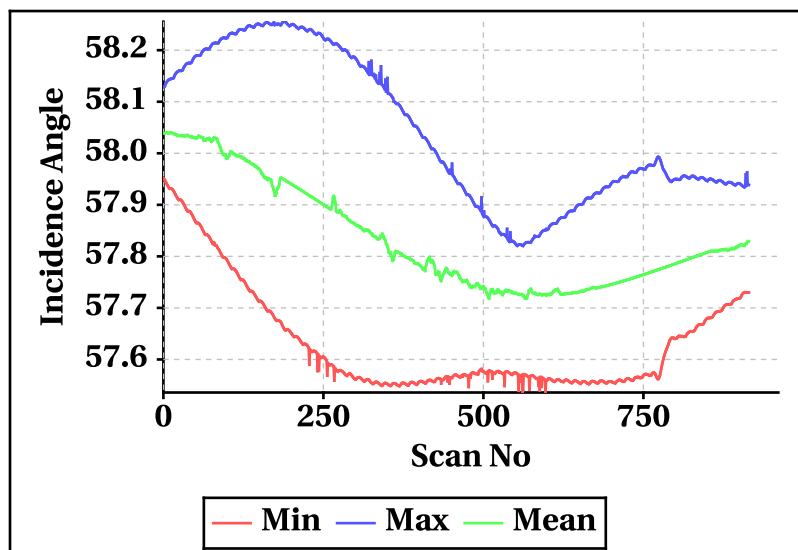


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

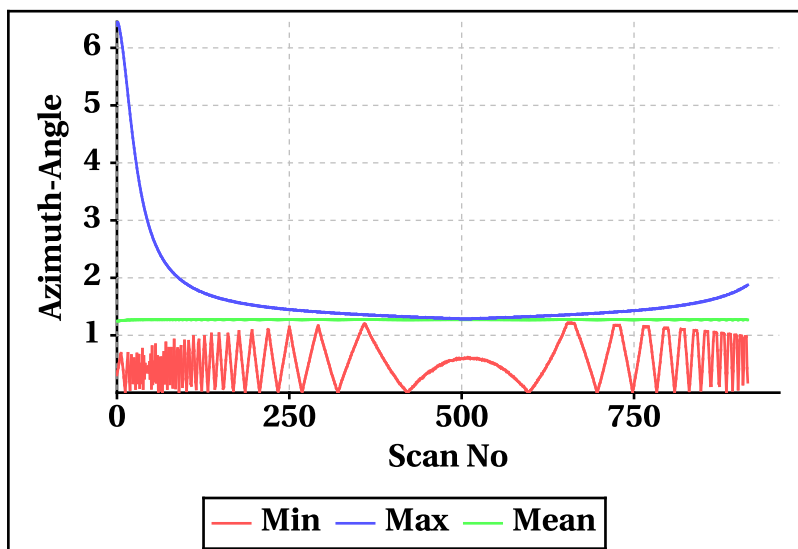
Inner Beam (HH)



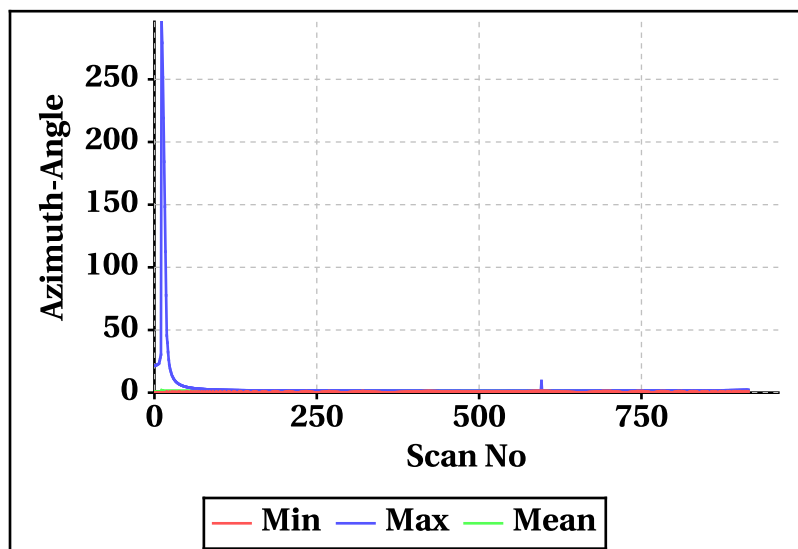
Outer Beam(VV)



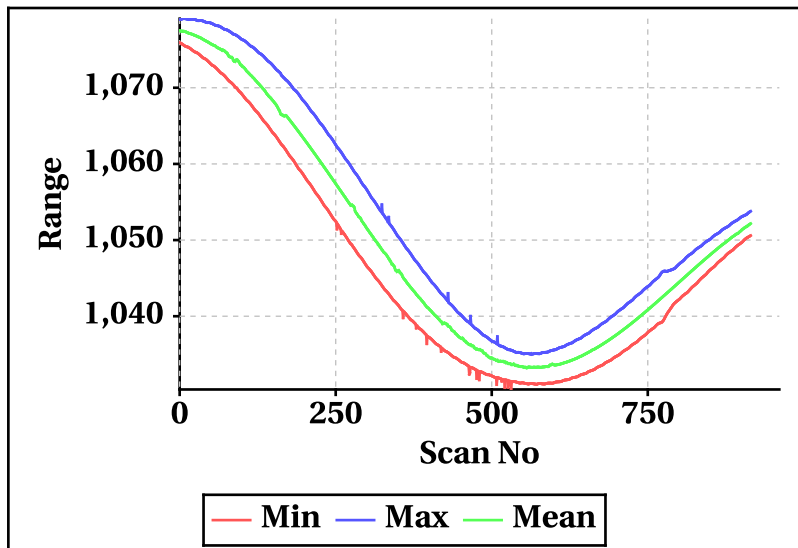
Inner Beam (HH)



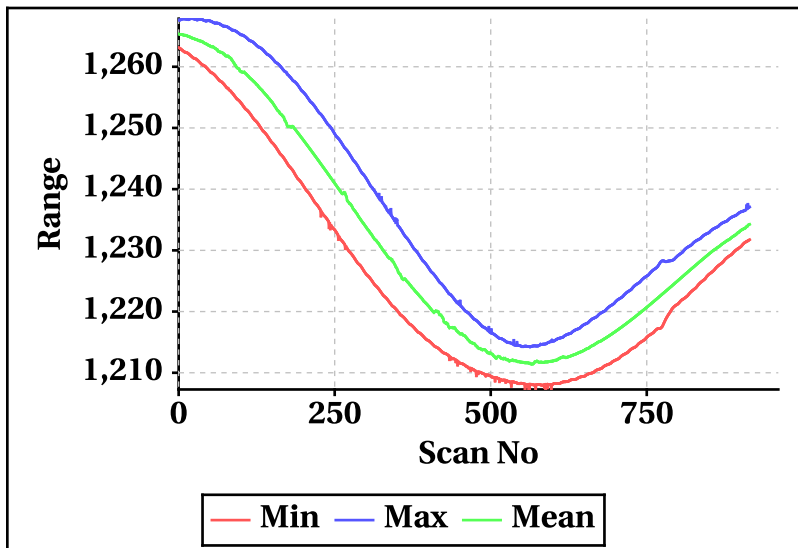
Outer Beam(VV)



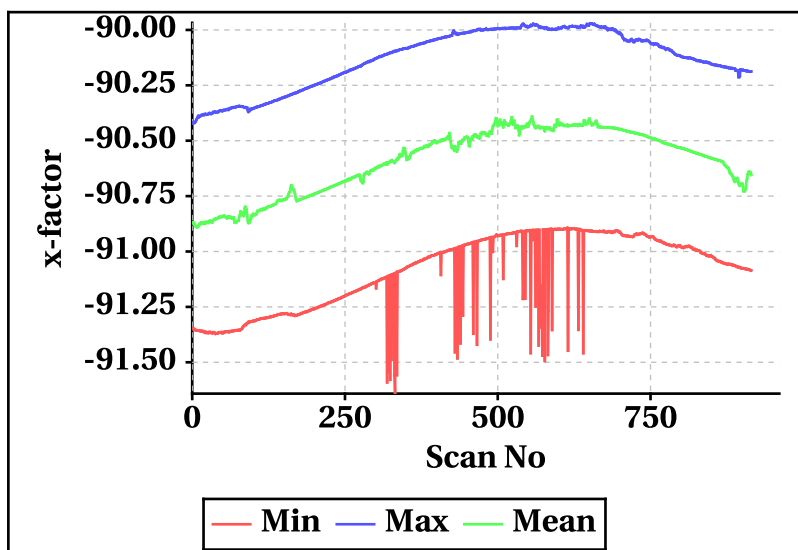
Inner Beam (HH)



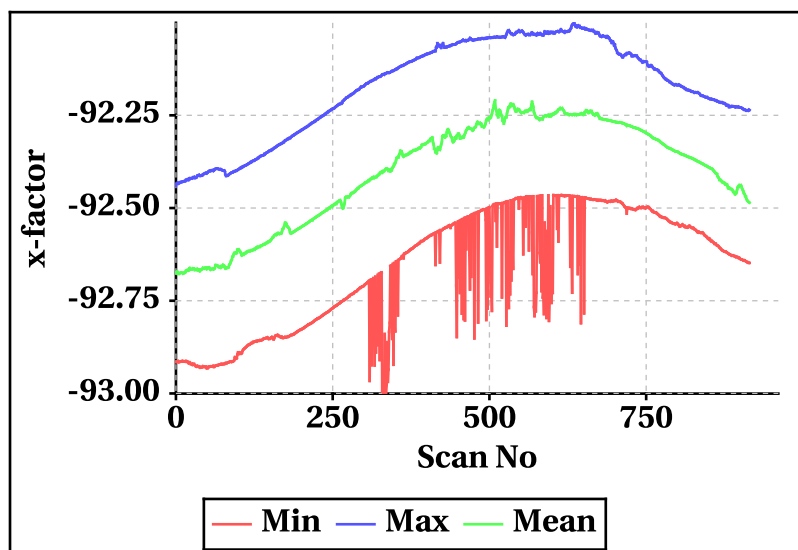
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

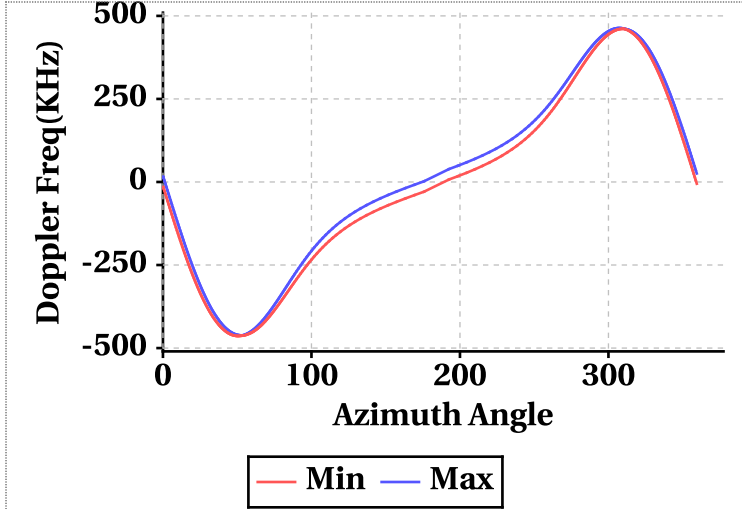


# Doppler Frequency Variation

**Doppler Frequency(KHz) variation statistics Over the half Orbit**

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-463.64	-519.56
<b>Max</b>	463.38	519.34

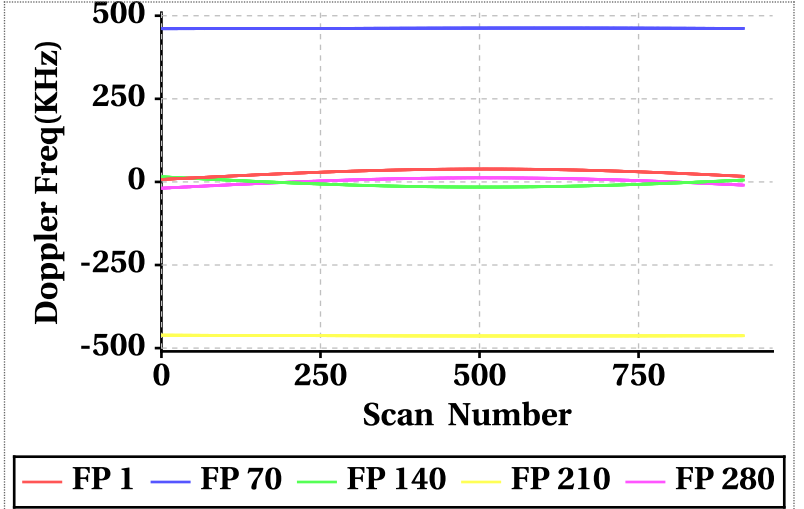
**Footprint wise Doppler frequency variation Inner Beam (HH)**



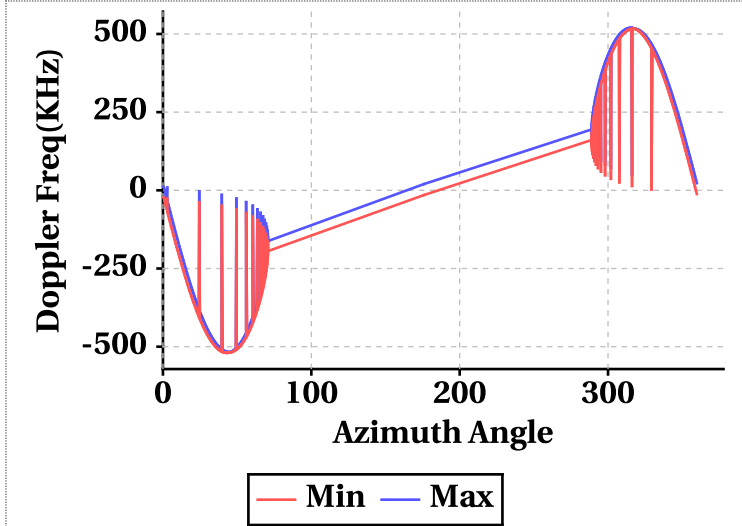
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	7.30	38.74	28.95	2.62	37.80	26.86
Doppler_70	460.90	462.90	462.19	516.48	519.02	518.17
Doppler_140	-15.54	15.34	-5.98	-23.26	11.42	-12.51
Doppler_210	-463.56	-461.10	-462.86	-519.36	-516.94	-518.66
Doppler_280	-18.96	12.40	2.53	-15.32	19.80	8.76

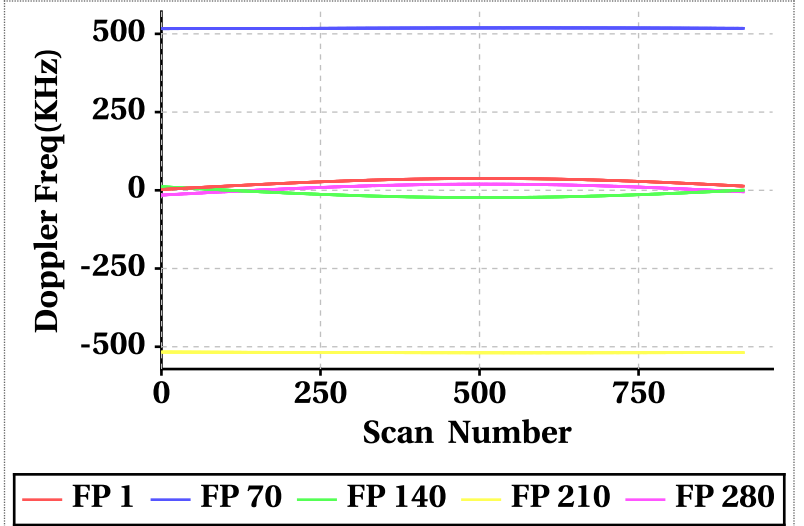
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



**Footprint wise Doppler frequency variation Outer Beam (VV)**

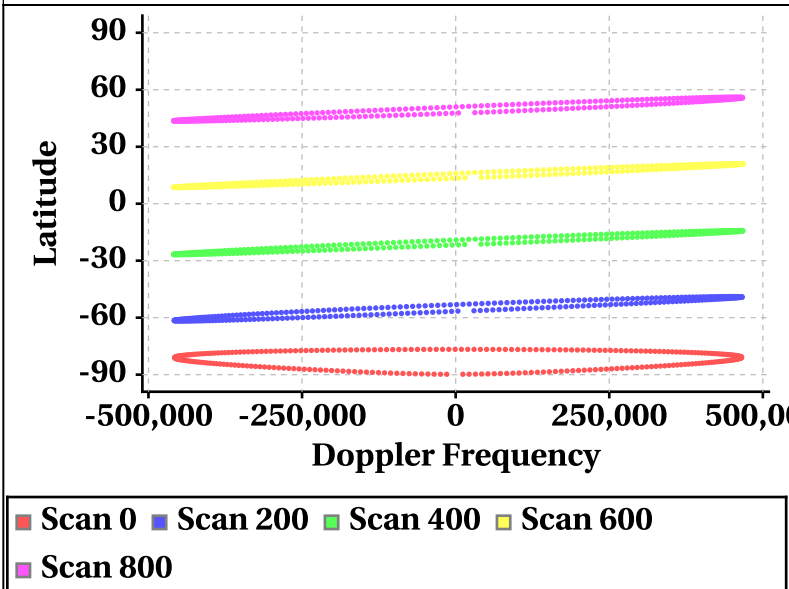


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

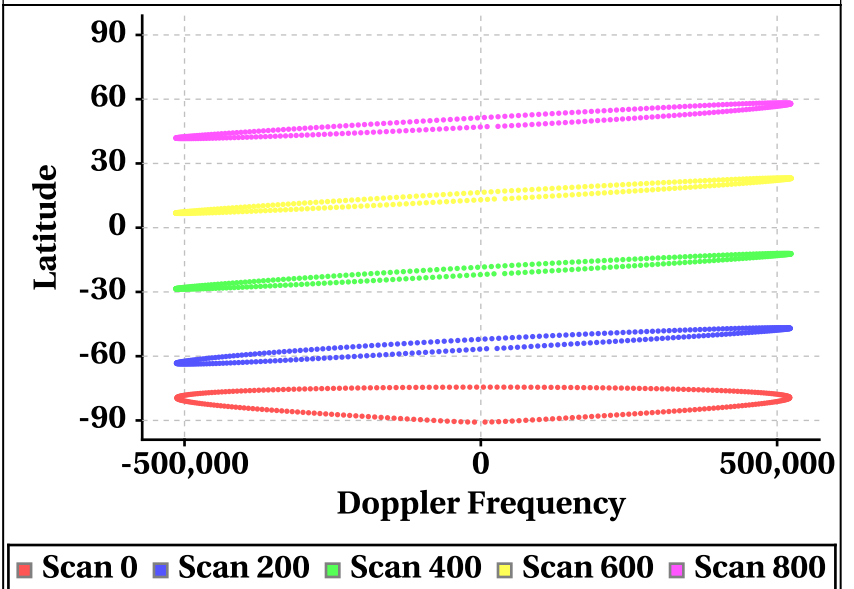


# Latitude Vs Doppler Frequency

**Doppler Frequency at Scan Interval of 200 [Inner Beam(HH)]**



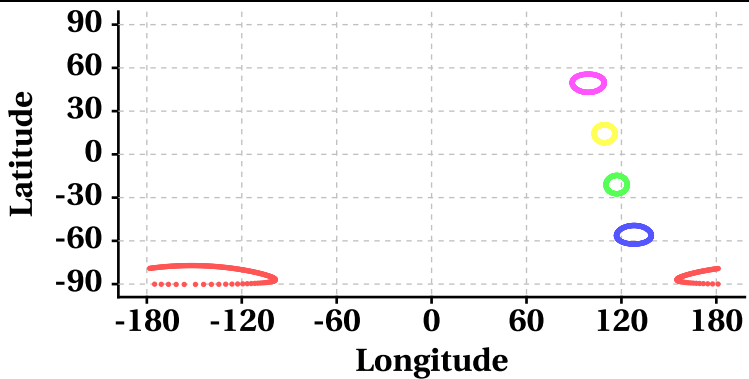
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

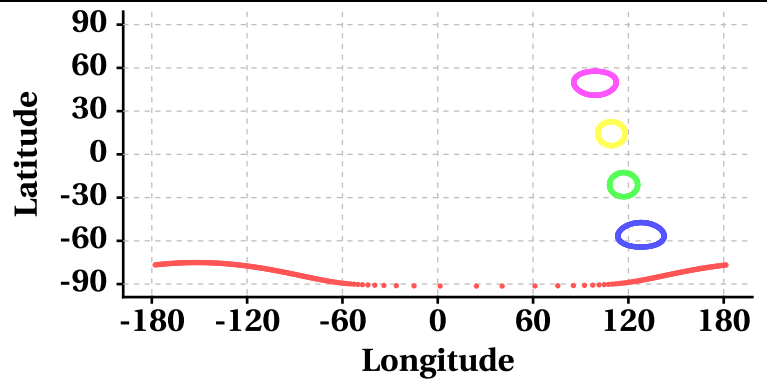
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

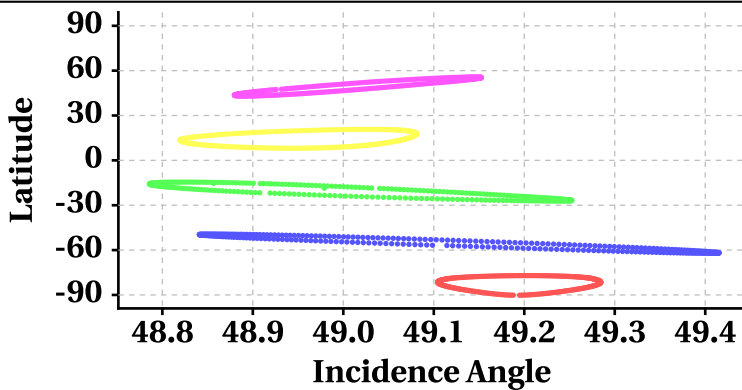
Scan Trace [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

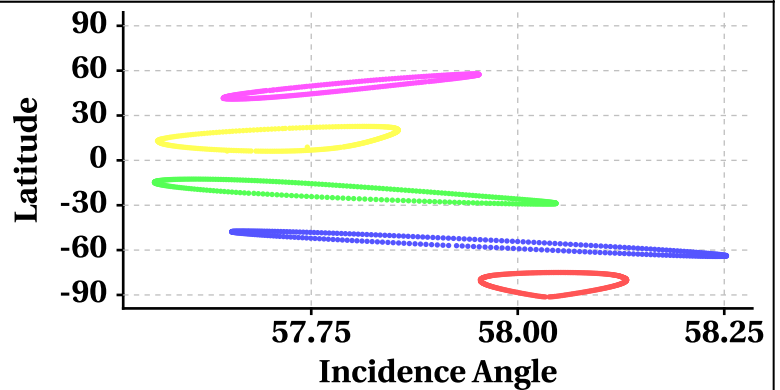
## Latitude Vs Incidence Angle

Incidence Angle at Scan Interval of 200 [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

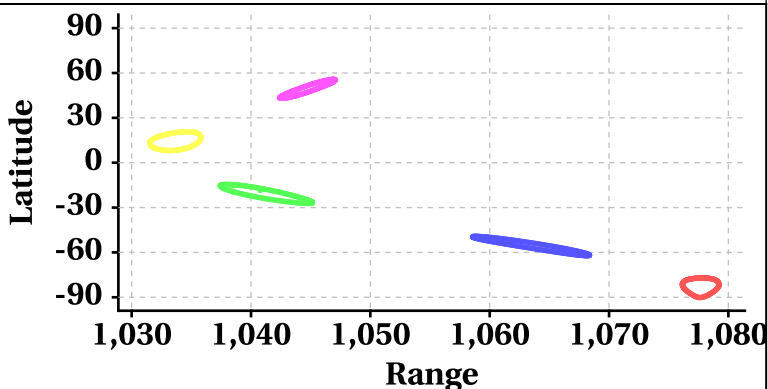
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

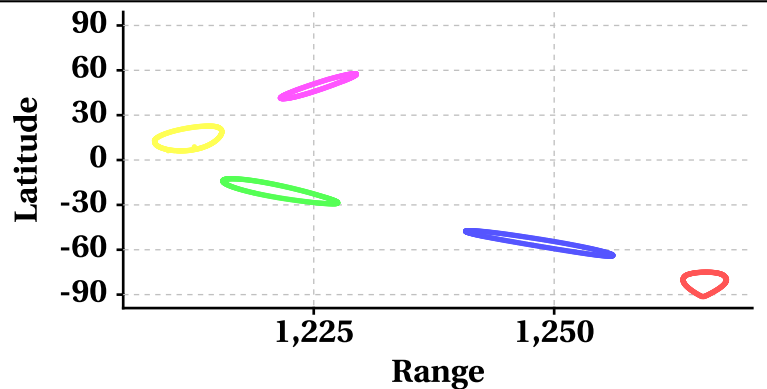
## Latitude Vs Range

Range at Scan Interval of 200 [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

Range at Scan Interval of 200 [Outer Beam(VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800



# Variation in Orbit and Attitude Parameters

