

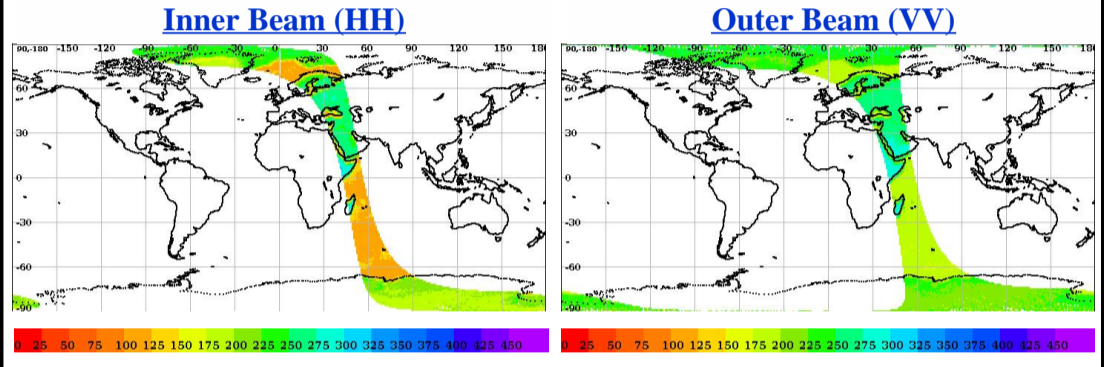
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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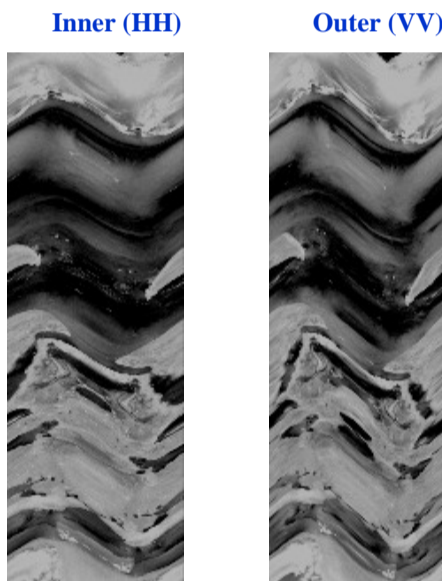
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	17914	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	17915	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.4	<b>Rev. Number</b>	17914_17915	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	13-02-2020	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	13-02-2020	<b>Equator Crossing Time</b>	17:05:30.000	<b>No Of Outer Slices</b>	15

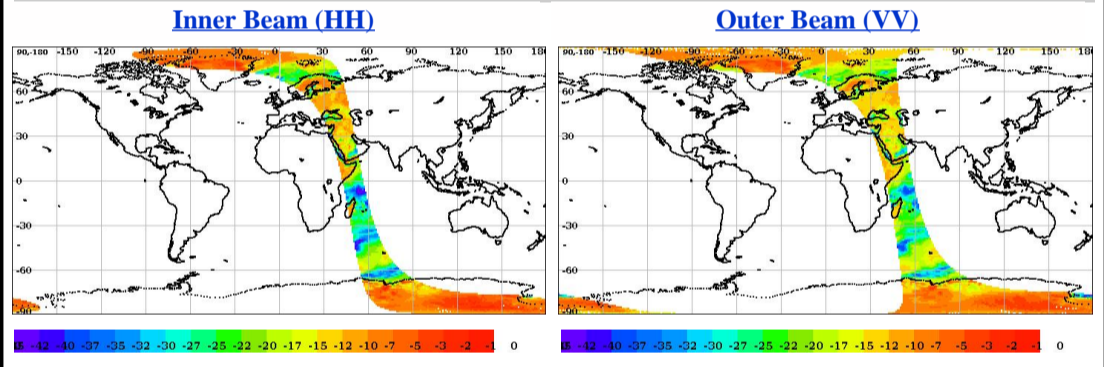
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



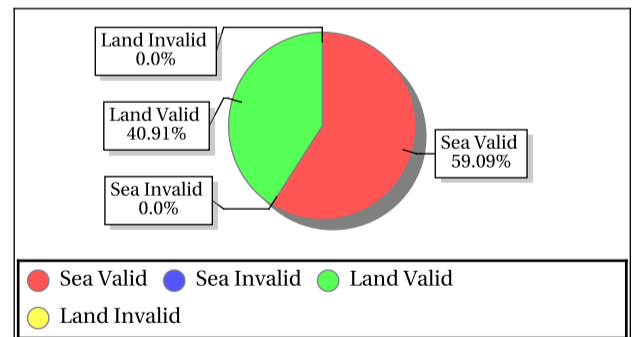
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.00	0.00
Data Not Available From Payload (%)	0.0	0.0
Slice not within sample array limits (%)	0.00	0.00
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.23	13.35
Noise samples for blending Saturated	0.001574	0.044404
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 (%)	0.039006	0.101694

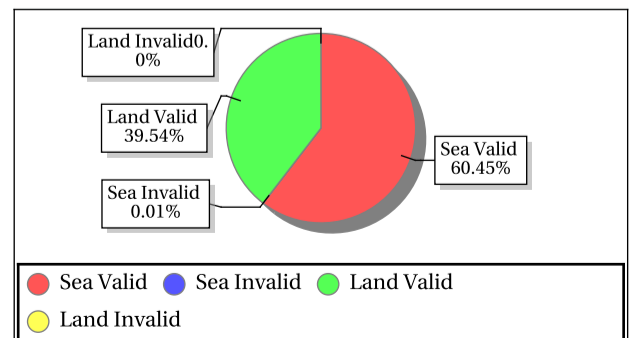
\*DP Format Document

## 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	-9.76	-5.42	-7.21	1.09	170.22	219.95	195.04	15.80
ANT_1	-75.00	121.00	Inner	ASC	Fore	-9.26	-6.09	-7.40	0.96	179.93	229.39	200.64	13.27
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-5.88	-4.69	-5.26	0.38	167.14	207.46	185.26	11.99
ANT_1	-75.00	121.00	Outer	ASC	Aft	-9.54	-6.92	-8.49	0.85	184.74	246.34	217.07	17.94
ANT_1	-75.00	121.00	Outer	ASC	Fore	-9.41	-9.41	-9.41	0.00	231.45	231.45	231.45	0.00
ANT_1	-75.00	121.00	Outer	DSC	Fore	-9.05	-8.68	-8.86	0.18	198.26	222.34	210.30	12.04
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-5.45	-4.85	-5.22	0.23	223.77	258.46	239.79	12.75
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-9.95	-7.75	-8.90	0.59	200.97	272.76	236.61	14.97



## 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	297.92	0.40	3.951	0.12	254.84	0.36	3.578	0.12	3.79	0.12	0.013	0.12	4.69	0.12	0.007
<b>Kpa</b>	0.01	0.02	0.01	0.000	0.01	0.02	0.01	0.000	0.01	0.02	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>	-34.88	26.61	4.10	0.194	-34.20	27.58	5.33	0.455	-15.82	29.12	17.99	15.341	-16.76	30.70	18.47	16.221

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	223.20	0.40	4.673	0.09	192.76	0.38	4.157	0.09	109.81	0.11	0.219	0.09	32.69	0.10	0.086
<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>	-34.79	20.87	1.62	0.000	-34.15	20.22	2.48	0.000	-31.71	22.39	12.08	0.020	-26.44	23.38	12.13	0.127

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)

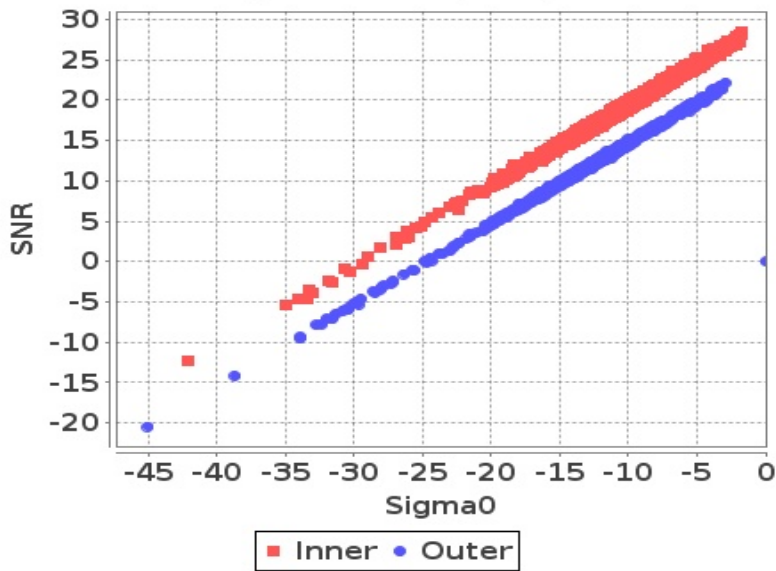
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.76	49.37	49.04	0.000	57.53	58.23	57.93	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0026	6.44	1.27	2.627	0.0027	299.93	1.27	3.961	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1033.56	1075.12	1051.57	0.000	1210.94	1263.36	1234.25	0.000	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.37	-89.65	-90.22	0.000	-92.86	-91.69	-92.07	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.57	16.08	15.79	0.000	5.23	37.75	20.89	6.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.79	20.71	19.74	0.000	9.83	35.08	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
									<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> Normal	<span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black; margin-right: 5px;"></span> Alarming	
									<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></span> Deviations	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black; margin-right: 5px;"></span> High Errors	



## Sigma0 Behaviour (Sigma0 Vs SNR)

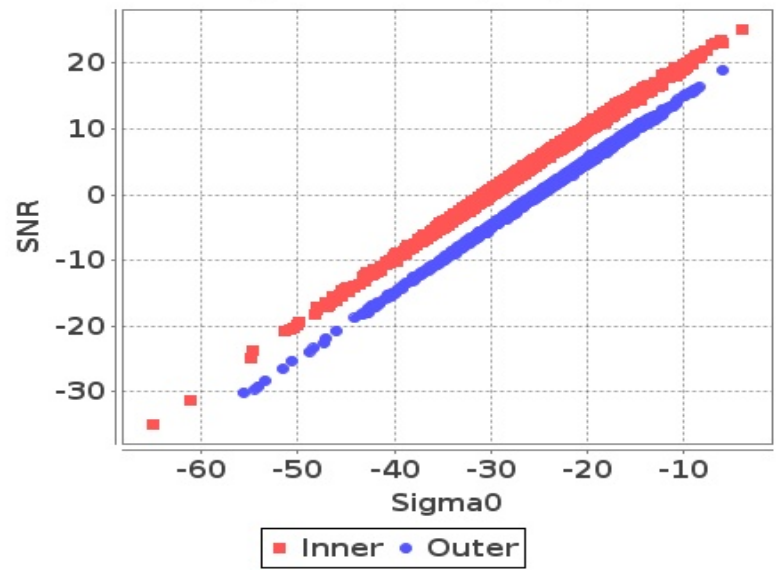
**Footprint-Land**

Sigma0 Vs SNR (Land)



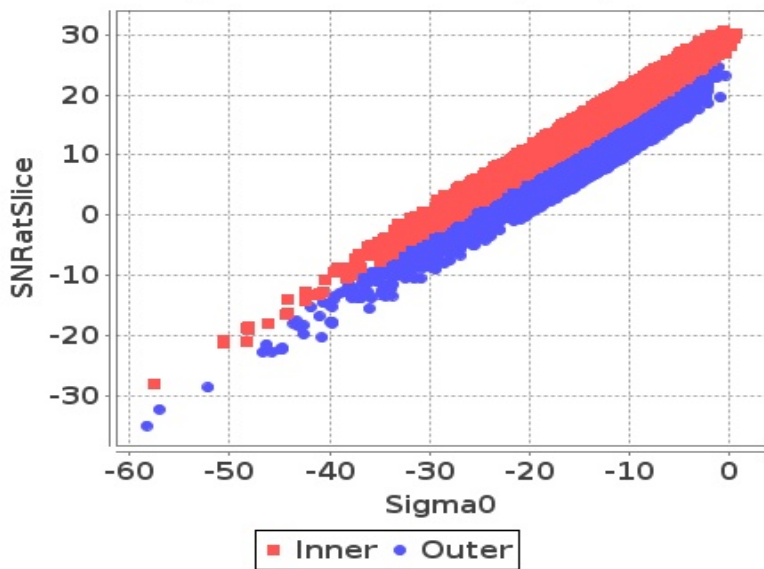
**Footprint-Sea**

Sigma0 Vs SNR (Sea)



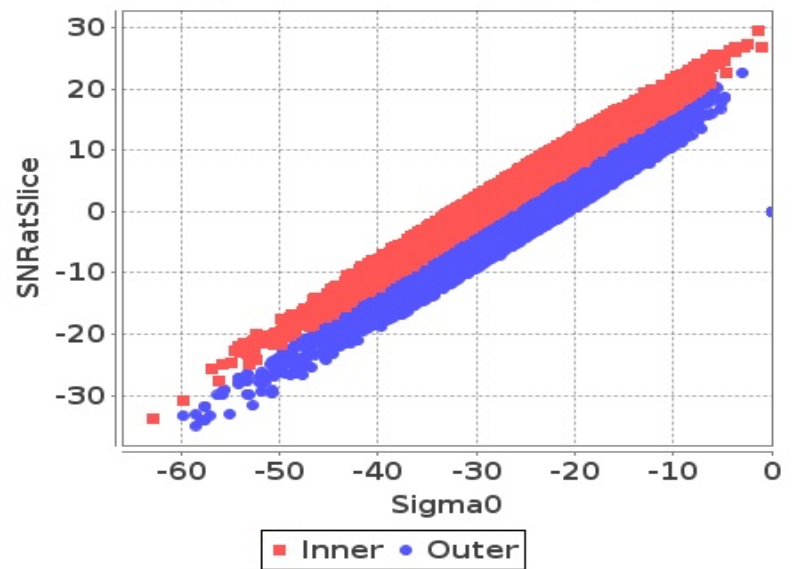
**Slice-Land**

Sigma0 Vs SNRatSlice (Land)



**Slice-Sea**

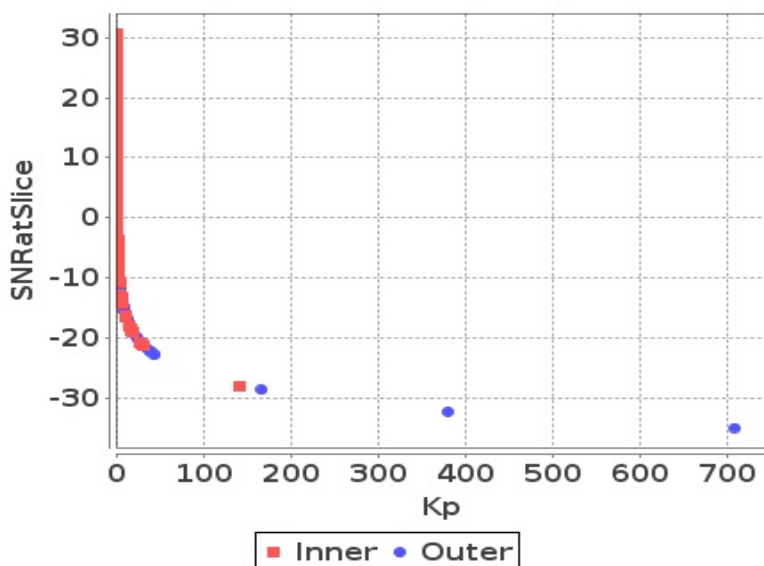
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

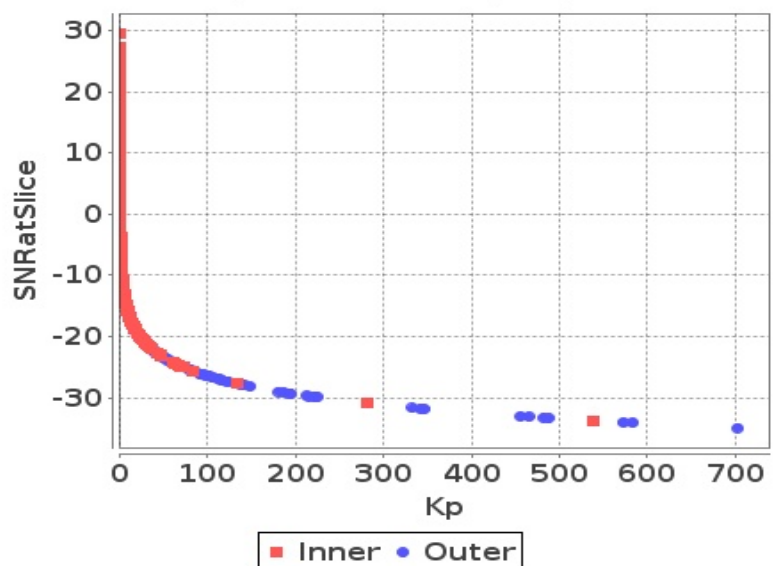
**Slice**

Kp Vs SNRatSlice (Land)



**Slice**

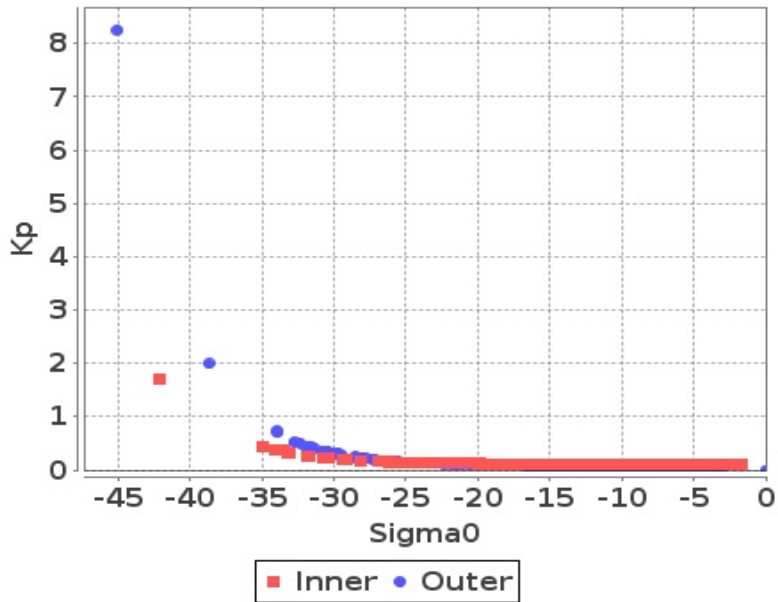
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

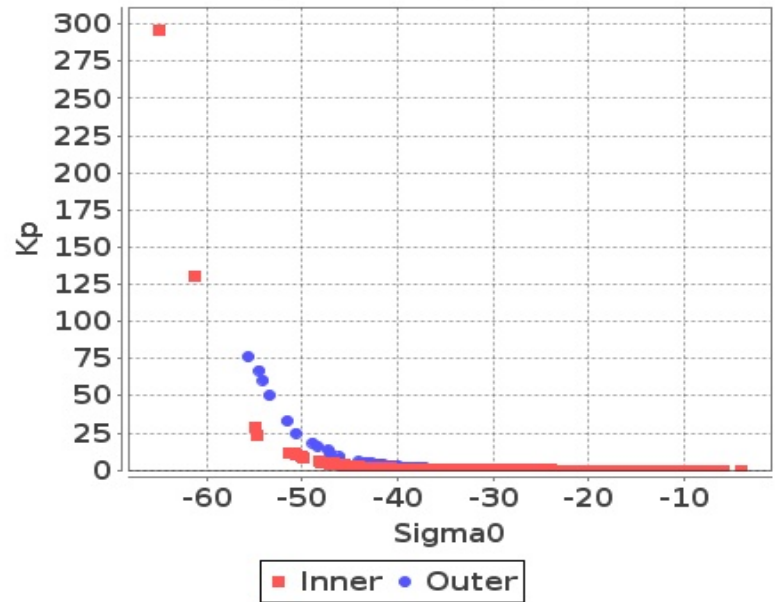
## Footprint-Land

### Sigma0 Vs Kp (Land)



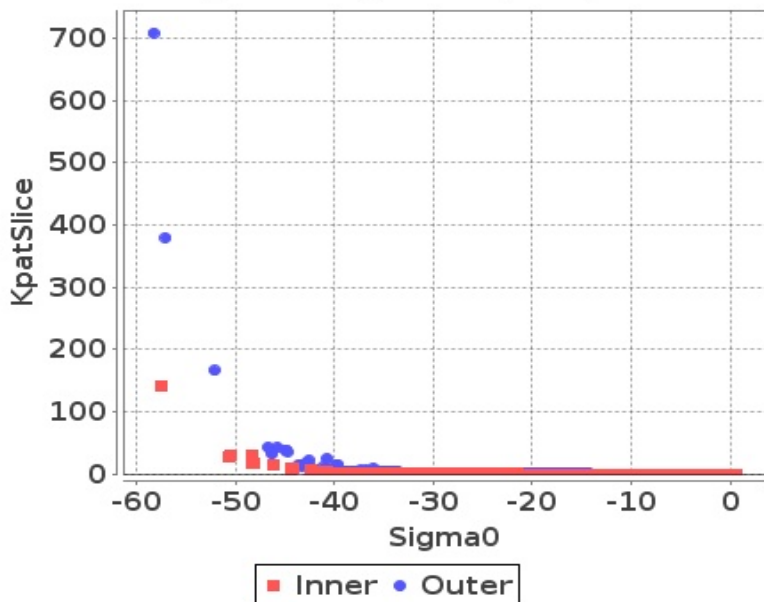
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



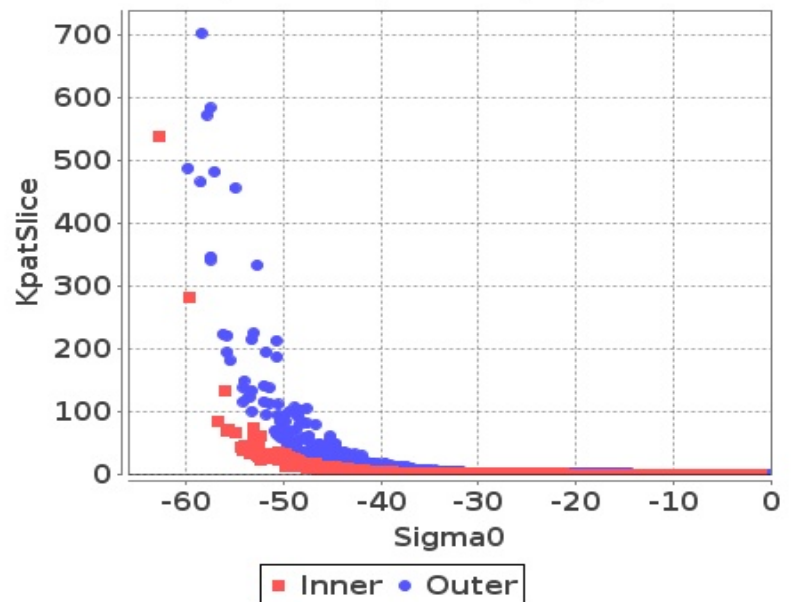
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

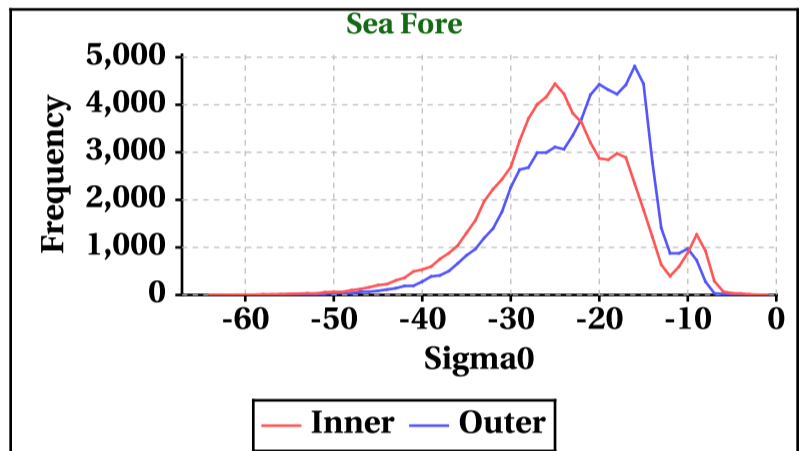
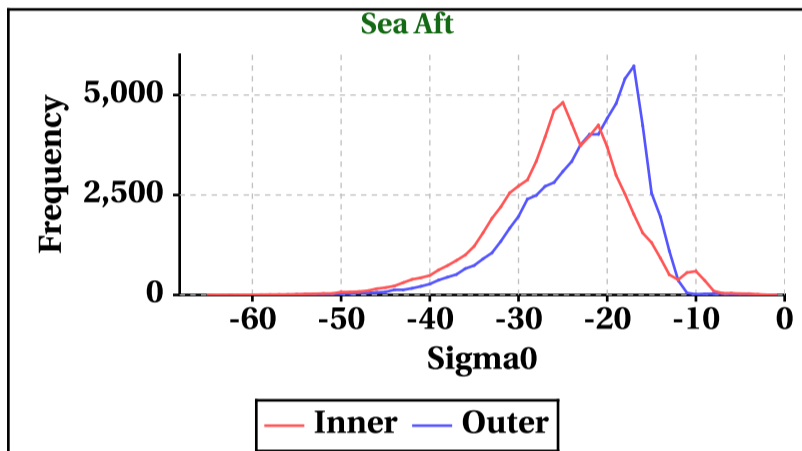
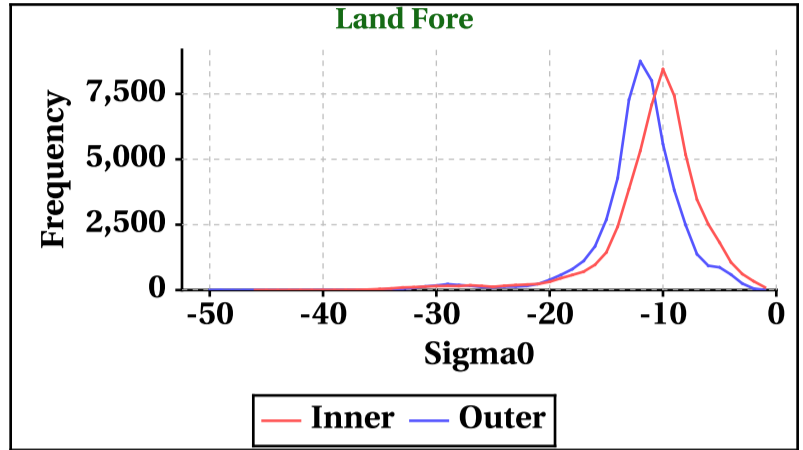
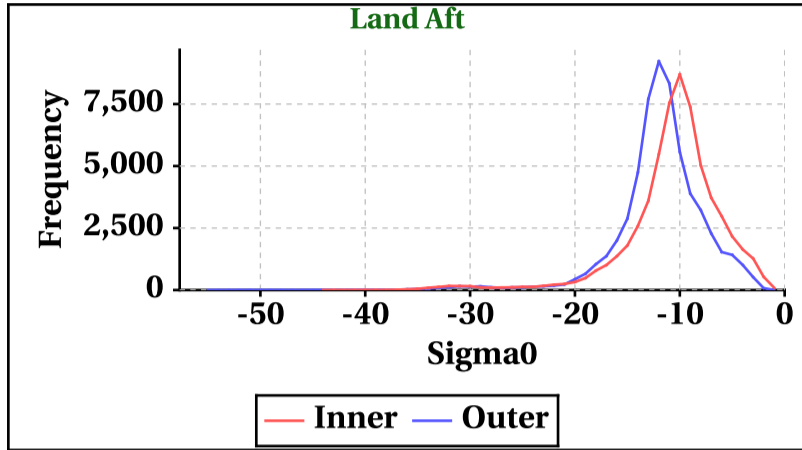


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-44	-46	-65	-64
Max	0	0	0	0

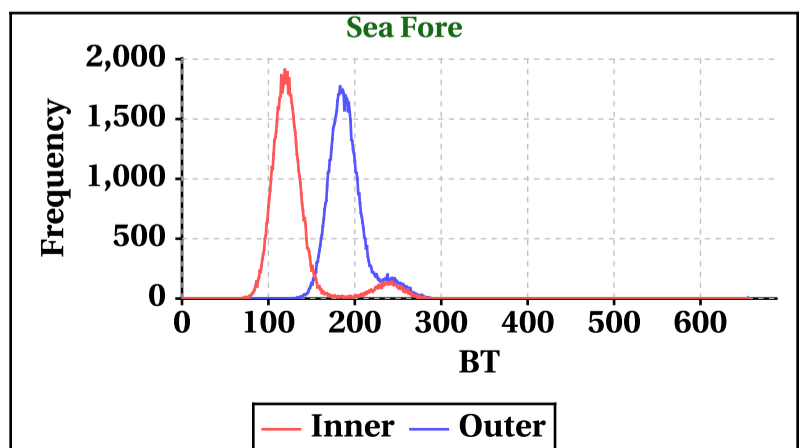
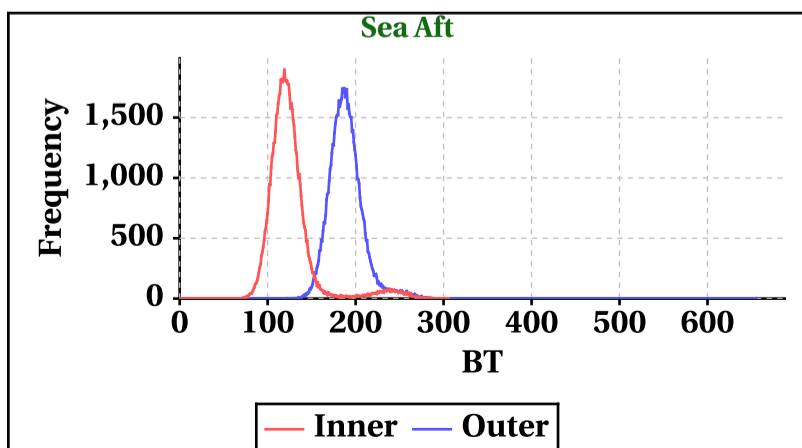
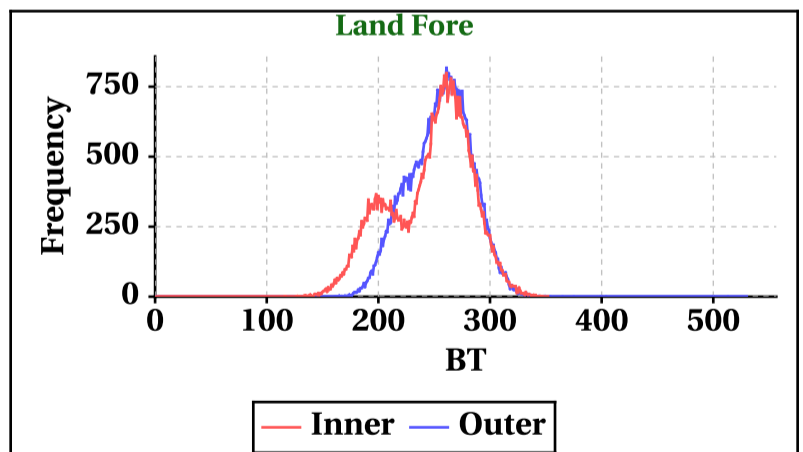
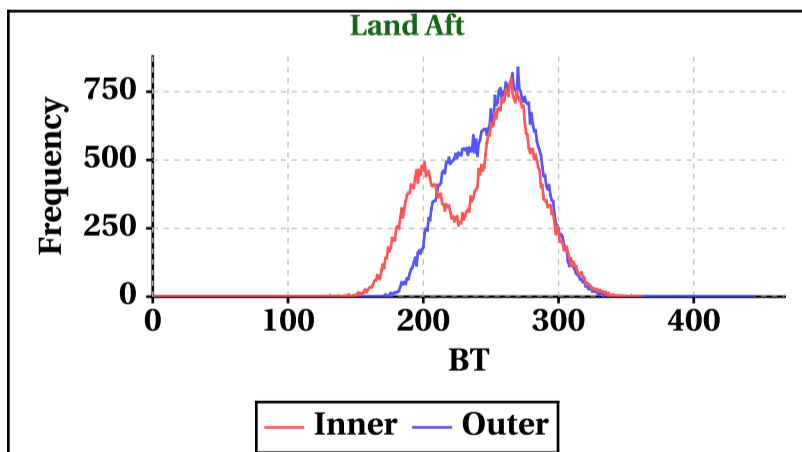
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-55	-50	-59	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	361	352	306	655

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	445	530	655	655

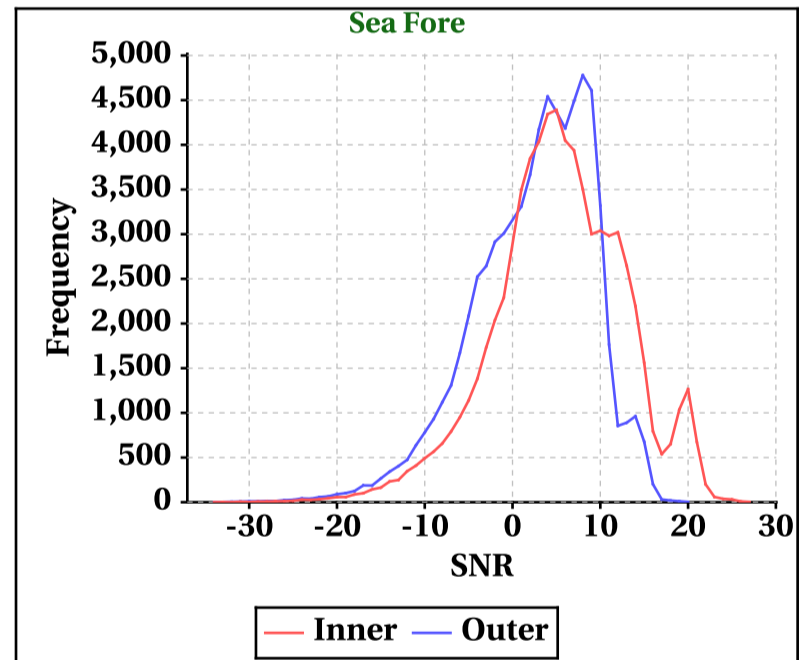
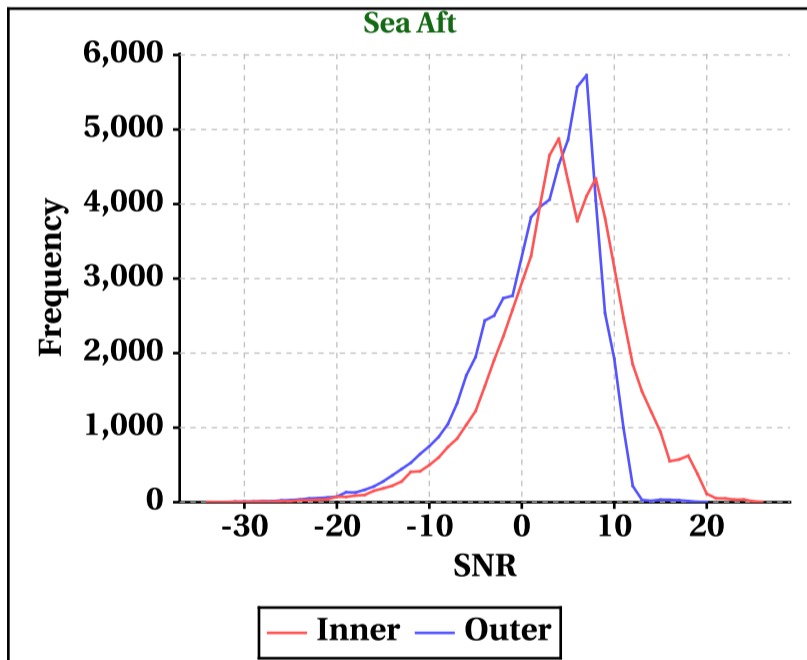
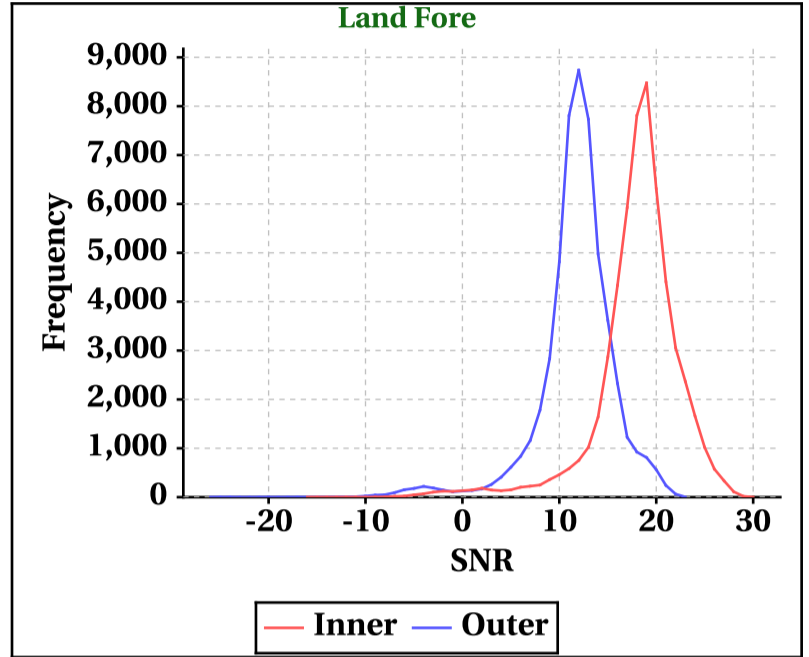
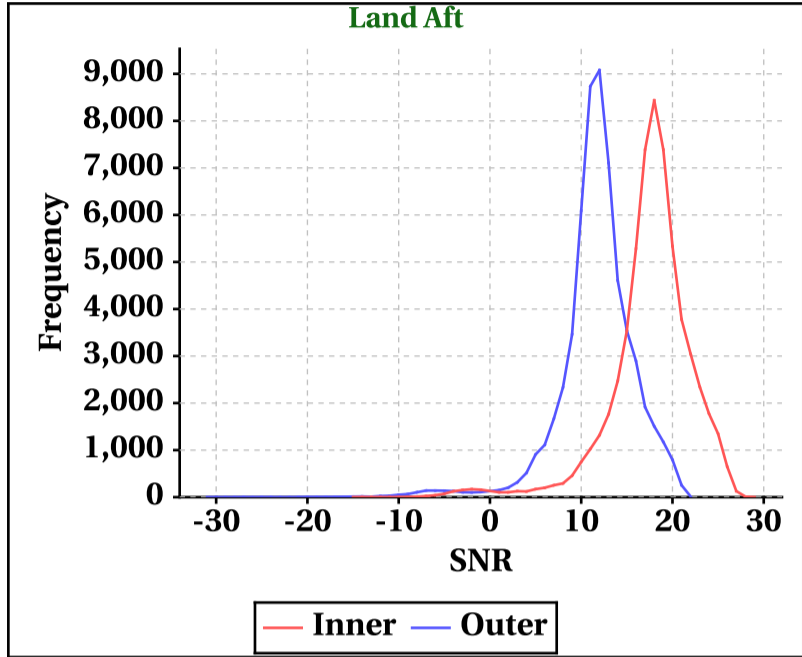


# Dynamic Range (Data Histograms)

## SNR(dBm)

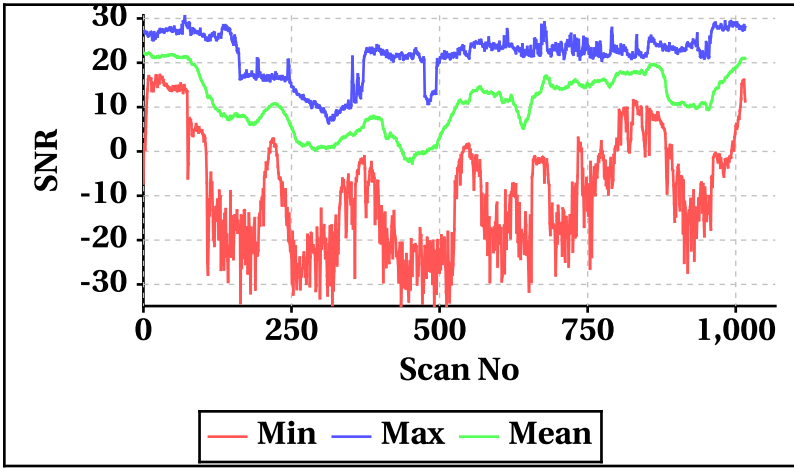
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-15	-16	-34	-34
Max	29	30	26	27

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-31	-26	-34	-34
Max	22	23	20	20

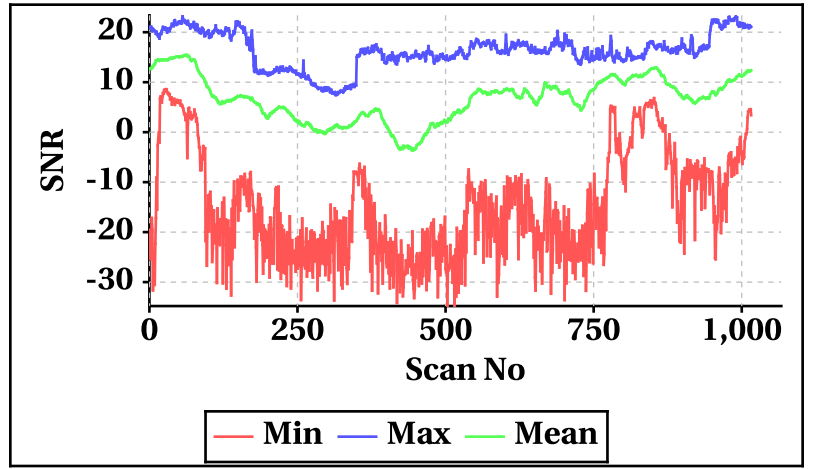


## Orbit-wise behaviour of SNR

**Inner Beam (HH)**

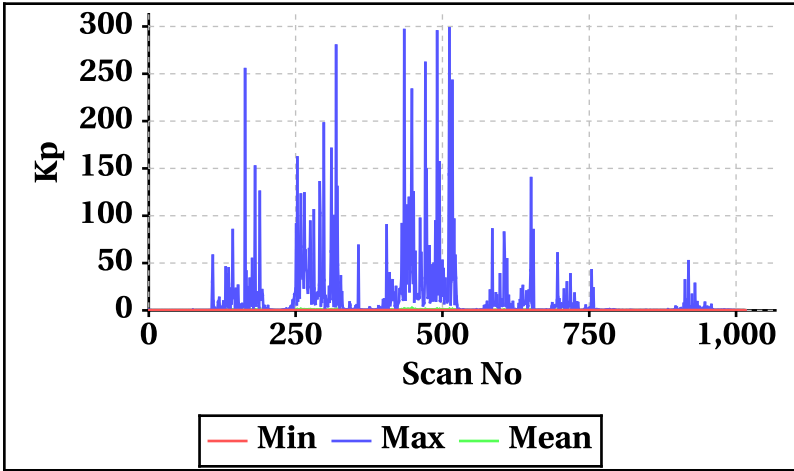


**Outer Beam(VV)**

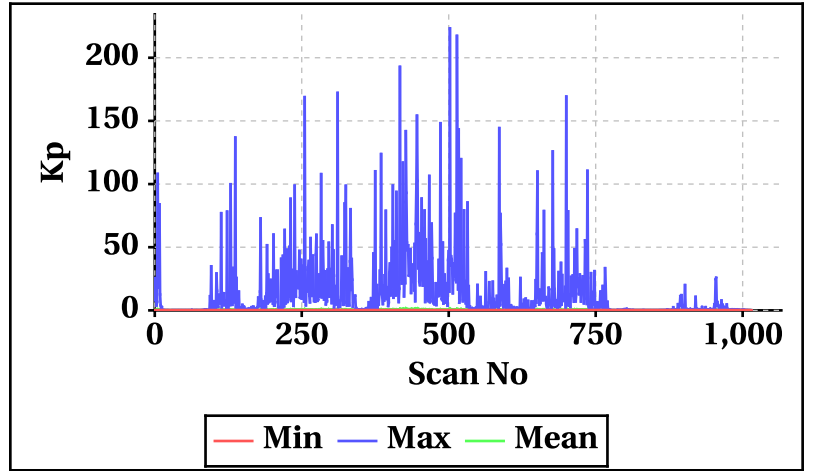


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

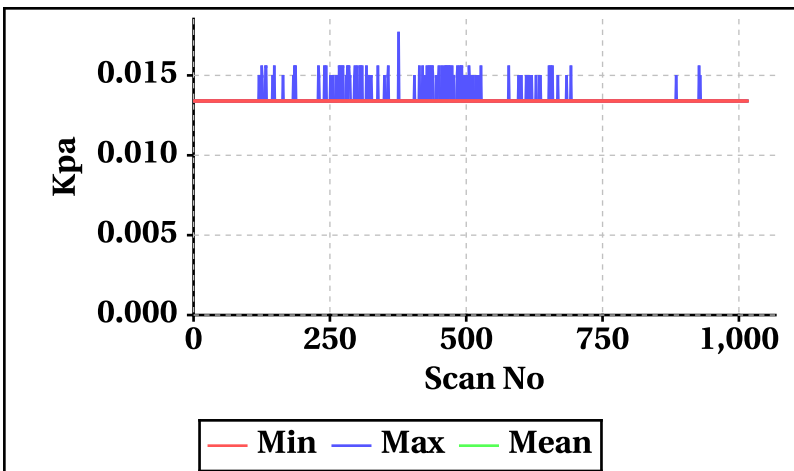
**Inner Beam(HH)**



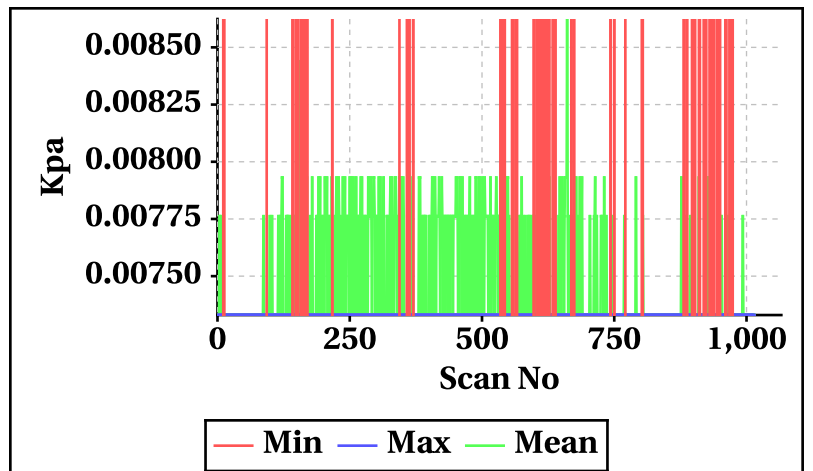
**Outer Beam(VV)**



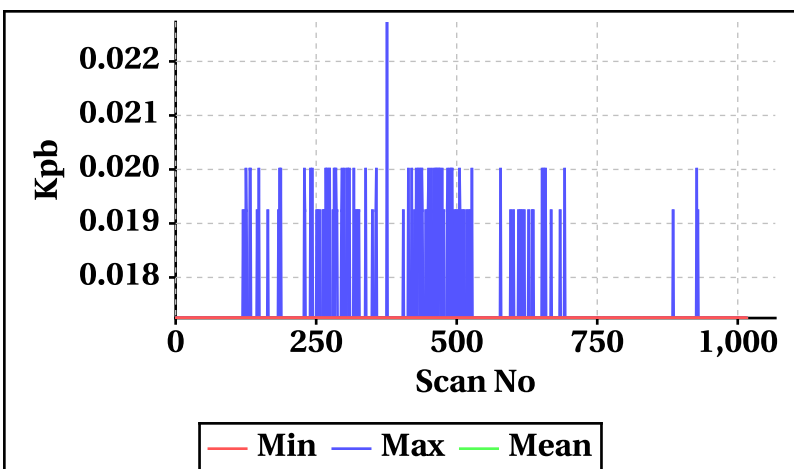
**Inner Beam(HH)**



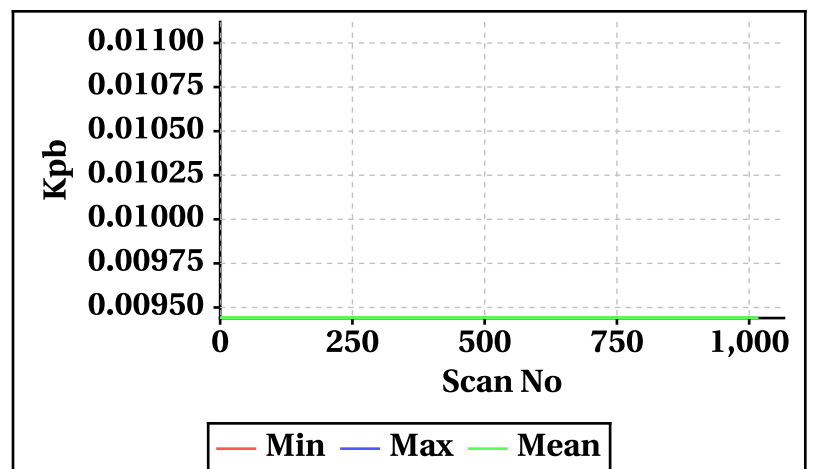
**Outer Beam(VV)**



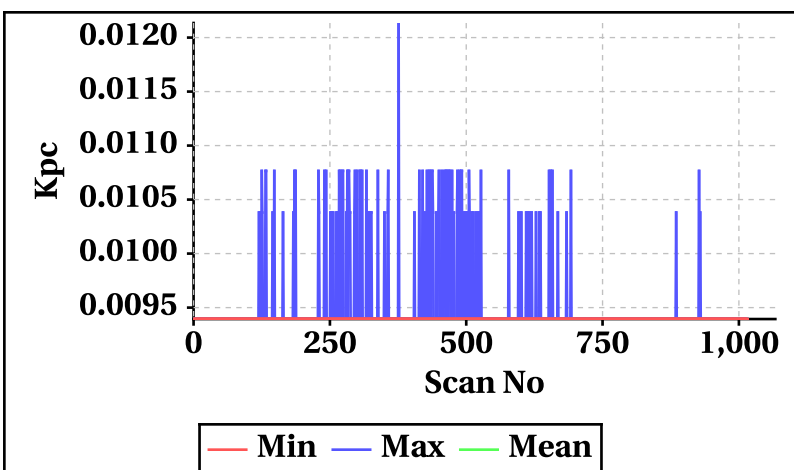
**Inner Beam(HH)**



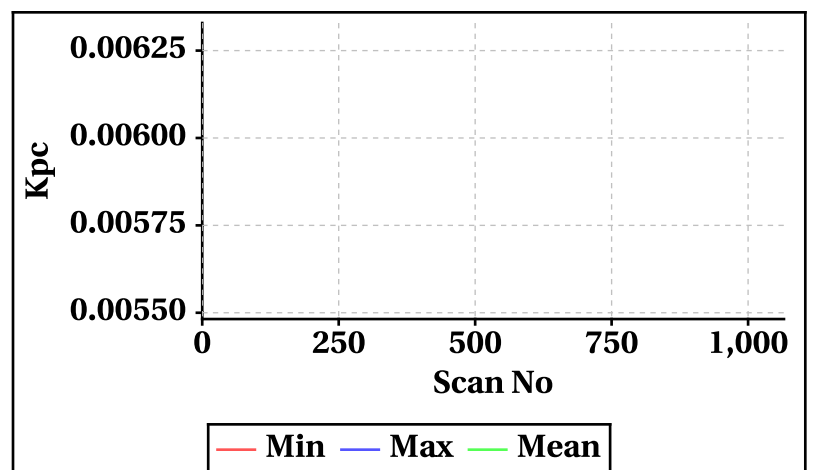
**Outer Beam(VV)**



**Inner Beam(HH)**



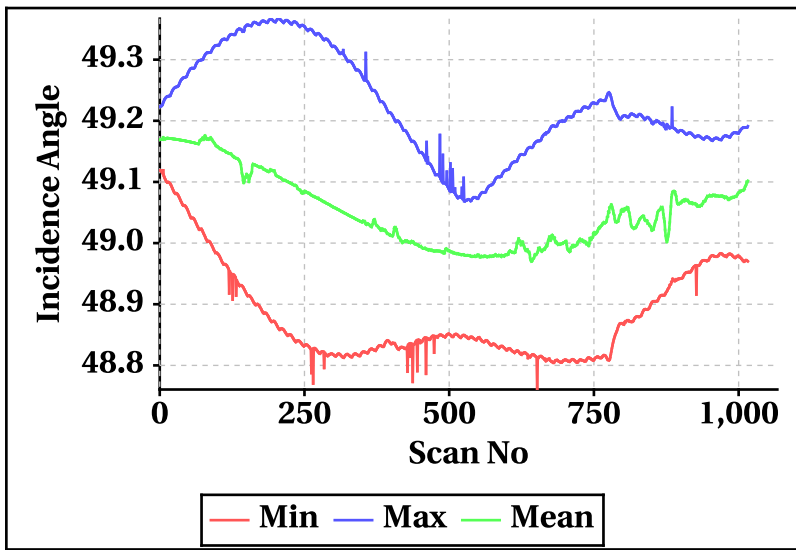
**Outer Beam(VV)**



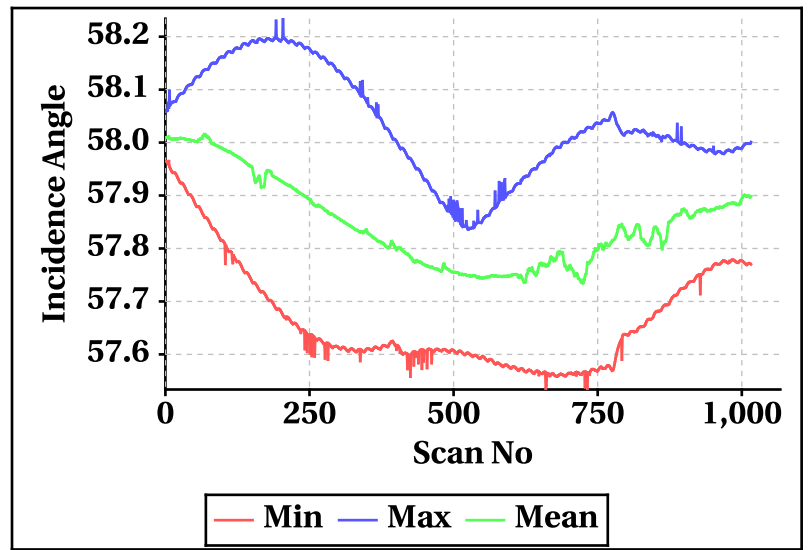


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

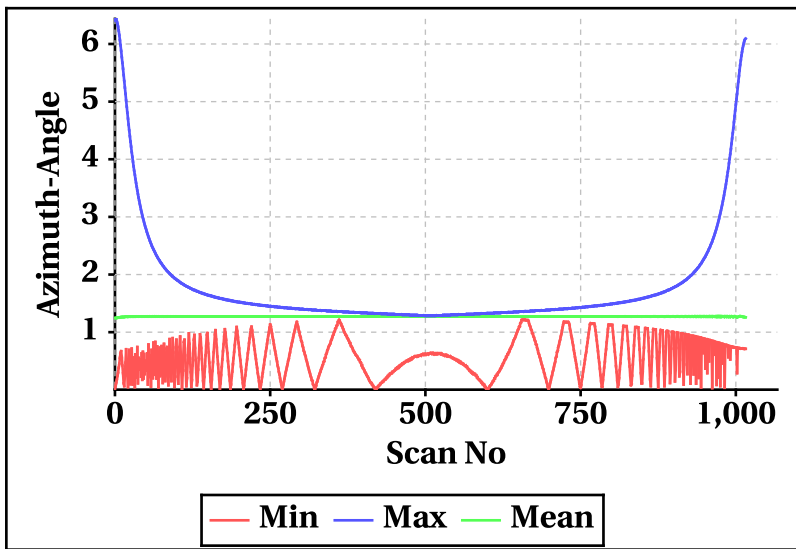
Inner Beam (HH)



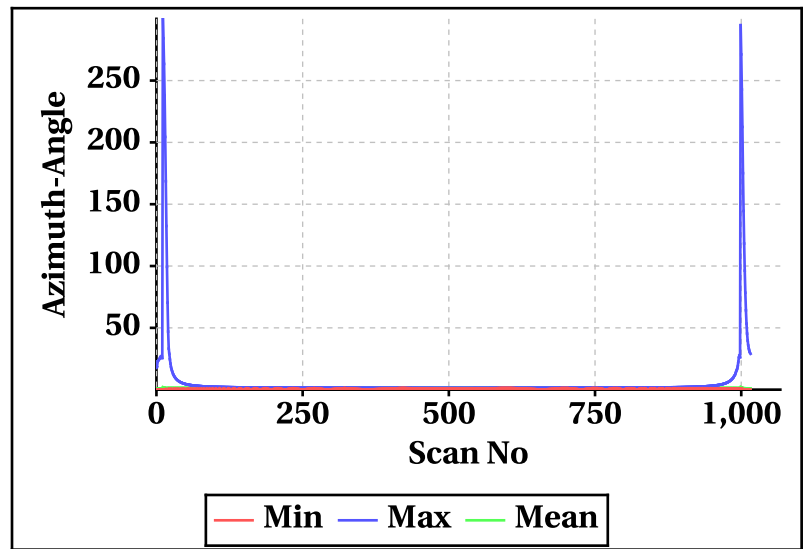
Outer Beam(VV)



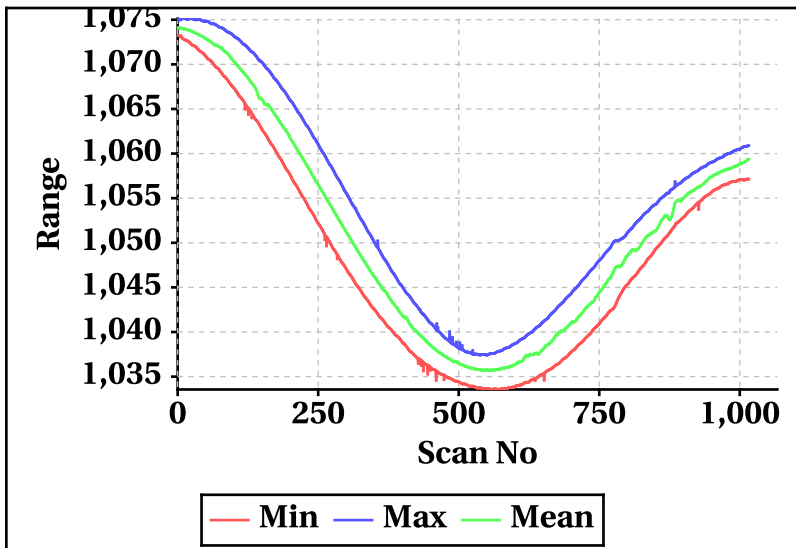
Inner Beam (HH)



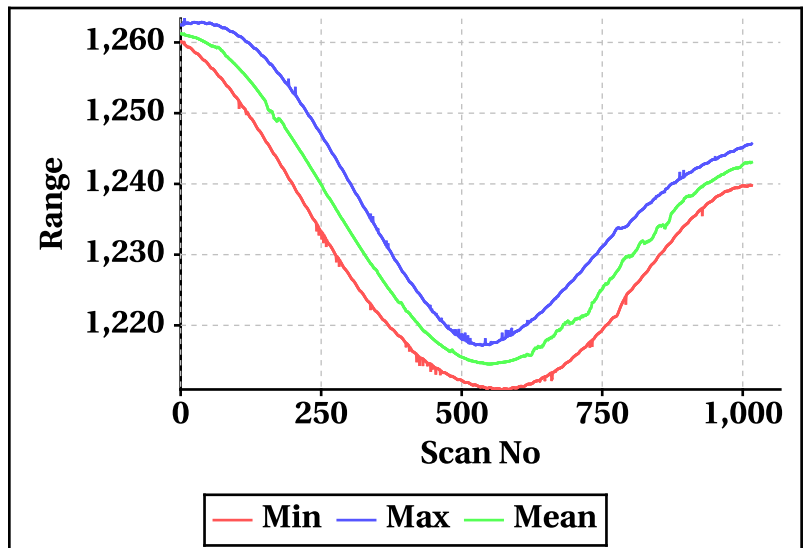
Outer Beam(VV)



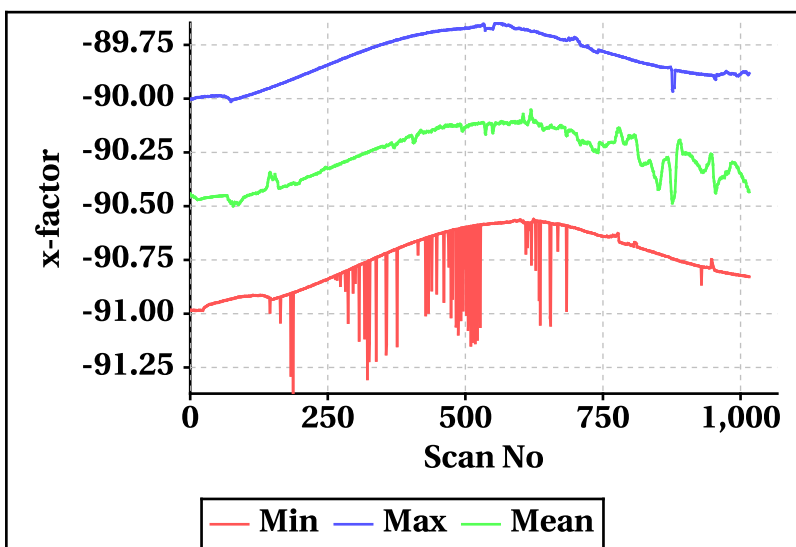
Inner Beam (HH)



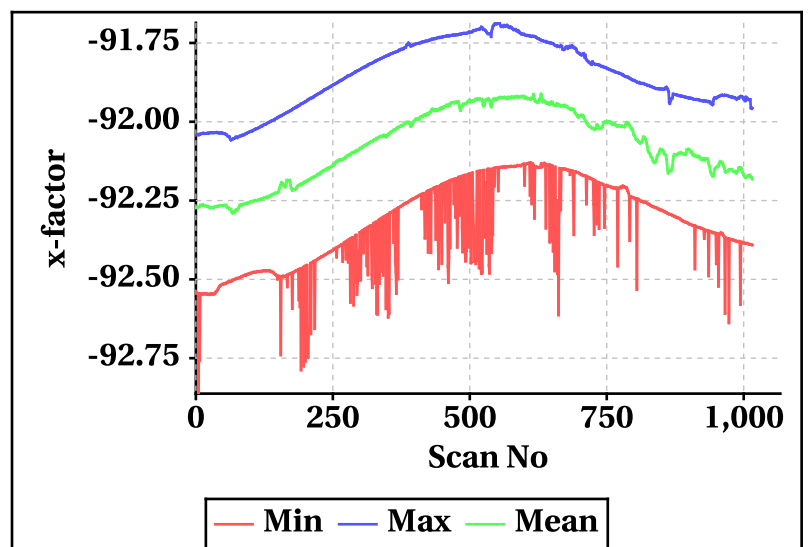
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

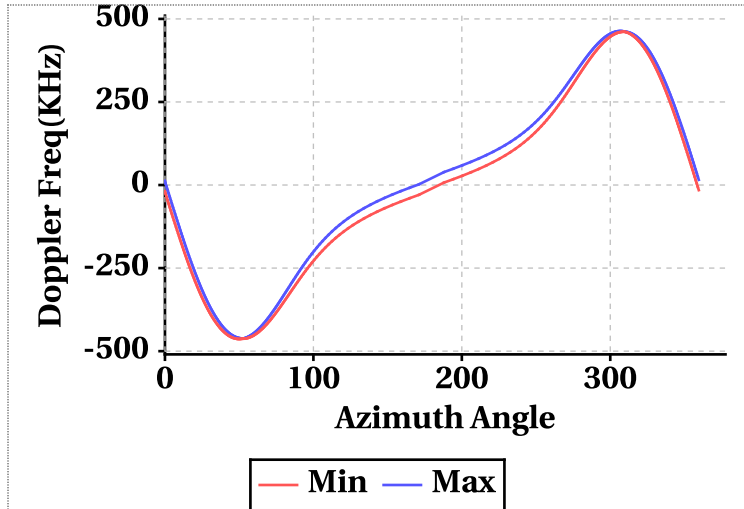


# Doppler Frequency Variation

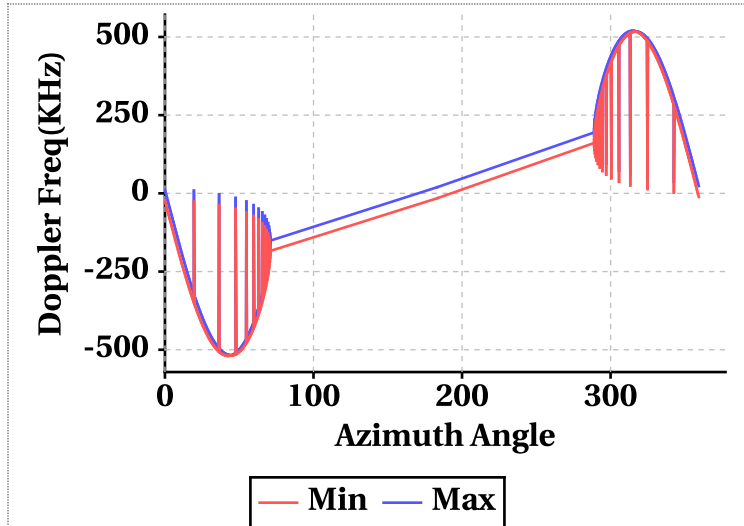
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-463.38	-519.32
Max	463.42	519.32

Footprint wise Doppler frequency variation Inner Beam (HH)



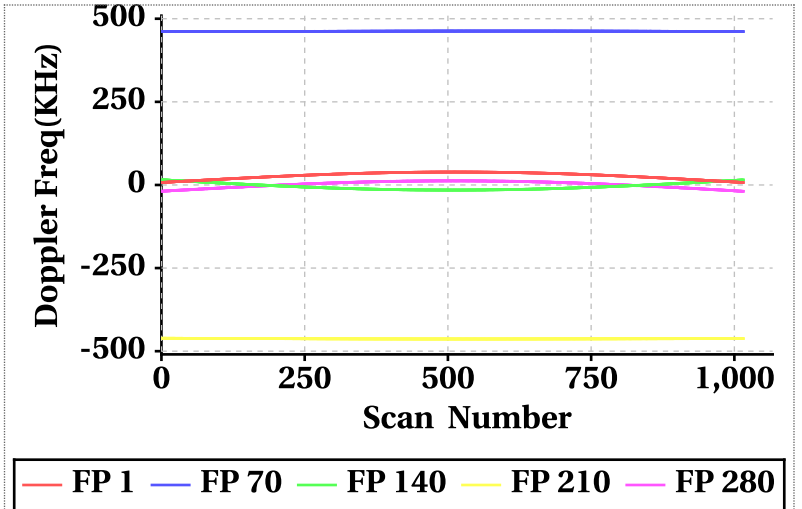
Footprint wise Doppler frequency variation Outer Beam (VV)



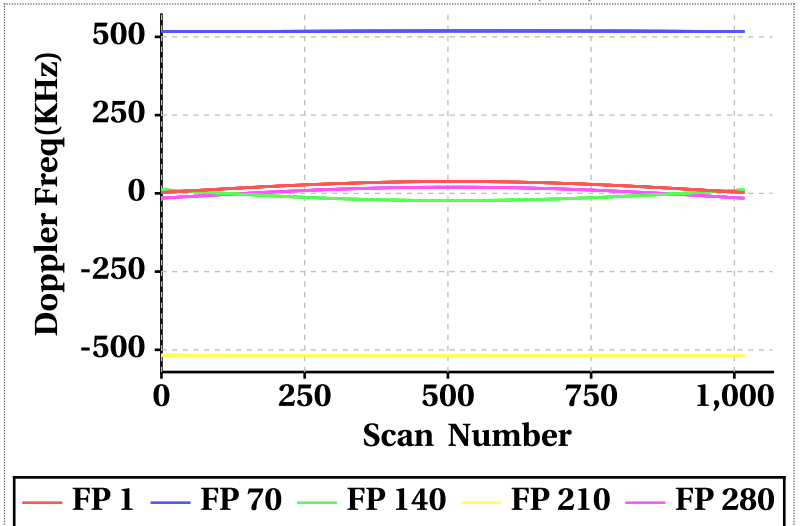
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	7.34	38.86	27.43	2.68	37.90	25.12
Doppler_70	461.20	462.94	462.24	516.76	519.04	518.18
Doppler_140	-15.36	15.70	-4.18	-23.10	11.78	-10.52
Doppler_210	-463.30	-461.06	-462.60	-519.10	-516.94	-518.42
Doppler_280	-19.10	12.44	0.99	-15.44	19.82	7.01

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

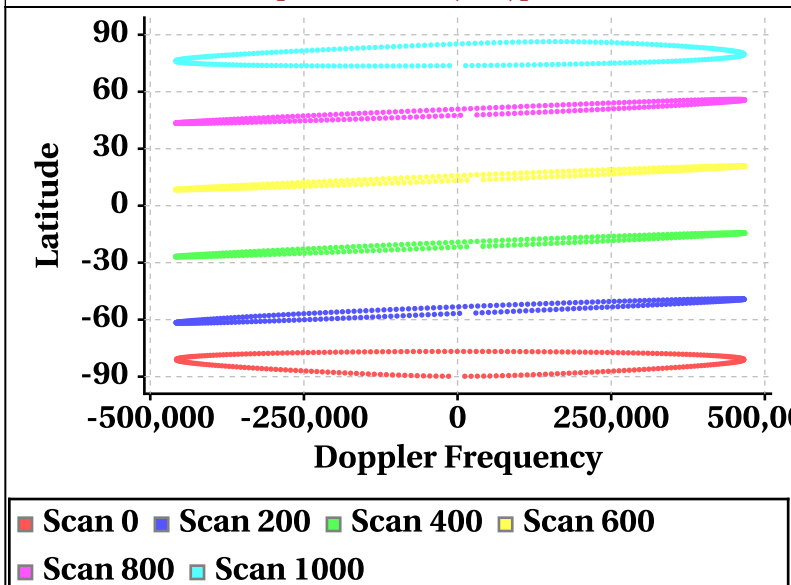


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

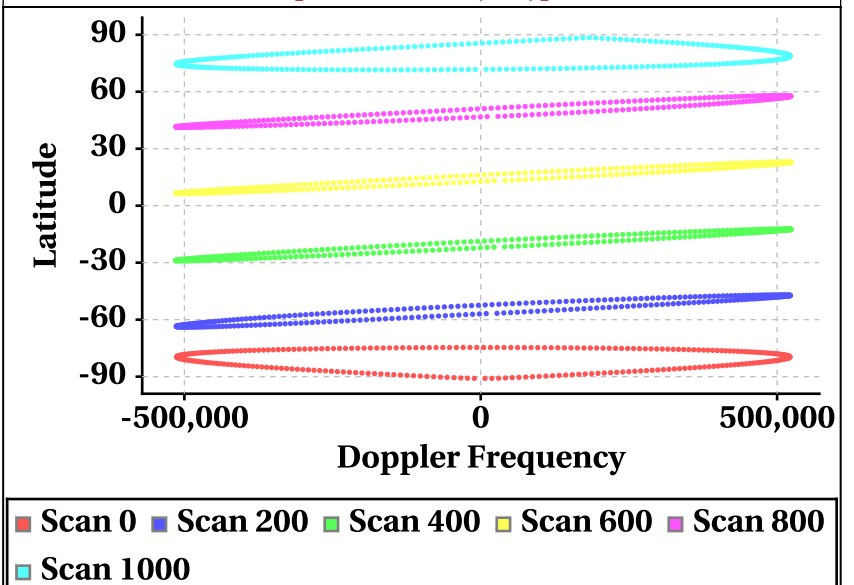


# Latitude Vs Doppler Frequency

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



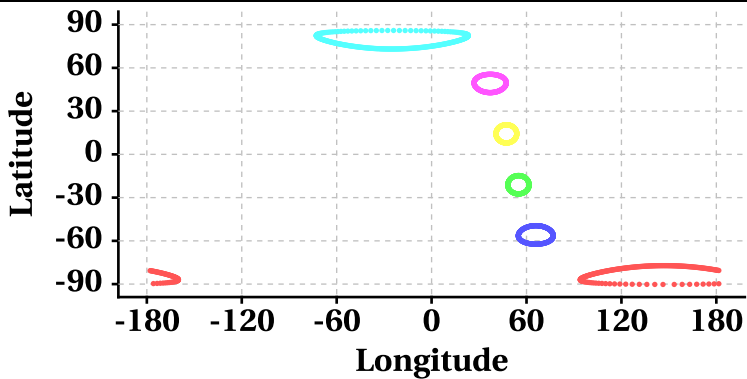
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

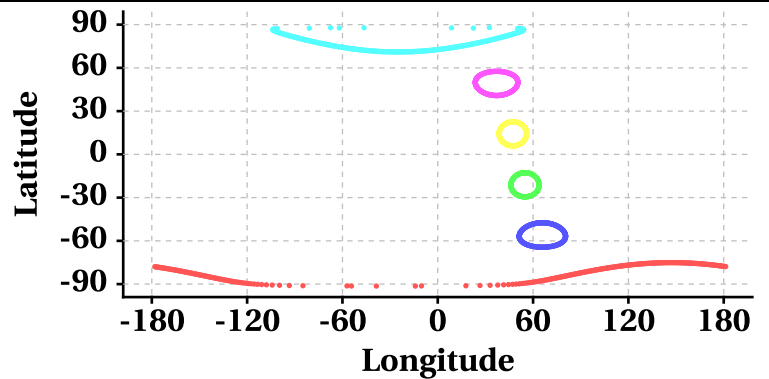
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800 Scan 1000

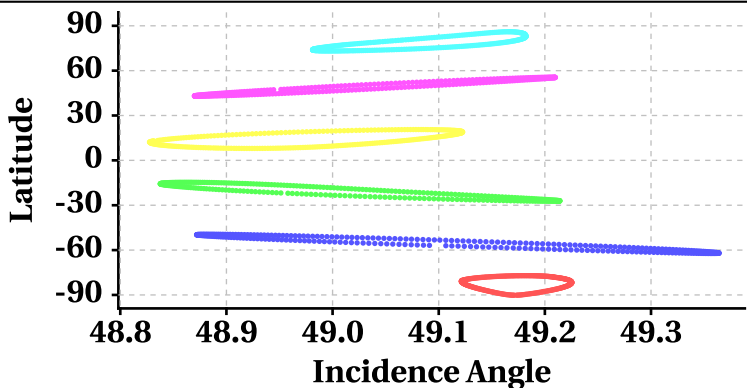
Scan Trace [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800 Scan 1000

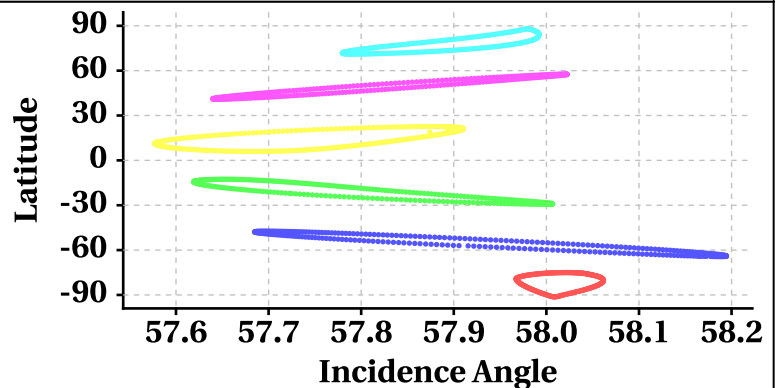
## Latitude Vs Incidence Angle

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800 Scan 1000

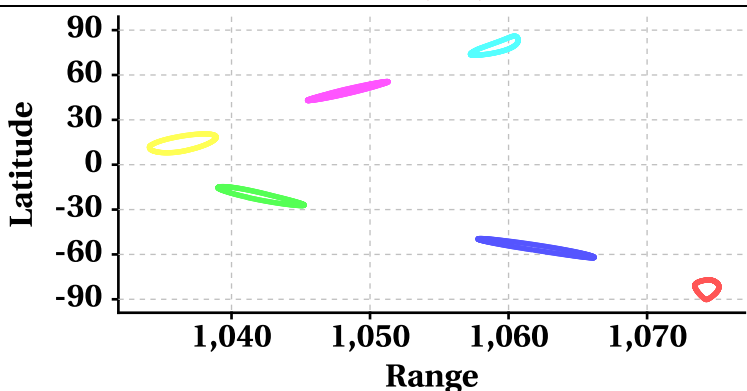
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800 Scan 1000

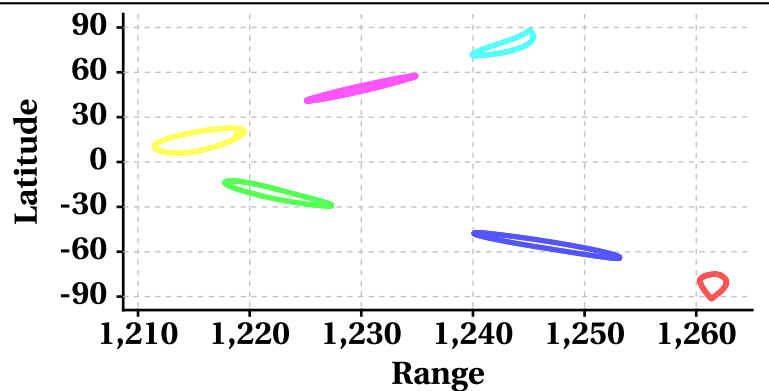
## Latitude Vs Range

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800 Scan 1000

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800 Scan 1000



# Variation in Orbit and Attitude Parameters

