

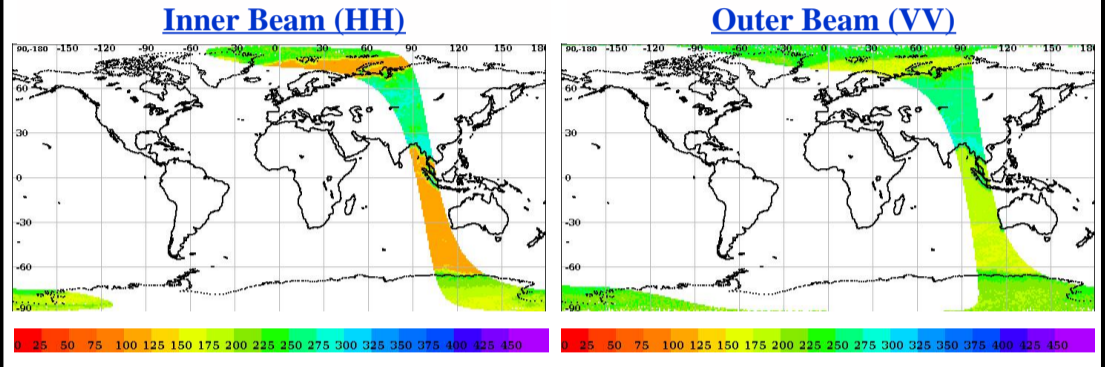
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

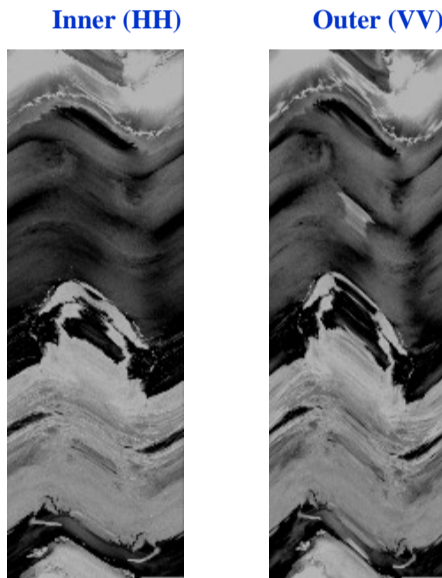
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along Track for HH/VV Beam)
- LIB Parameter as a function of Latitude
- Half Orbit OAT Behaviour

<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	16143	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	16144	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	16143_16144	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	14-10-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	14-10-2019	<b>Equator Crossing Time</b>	13:53:01.000	<b>No Of Outer Slices</b>	15

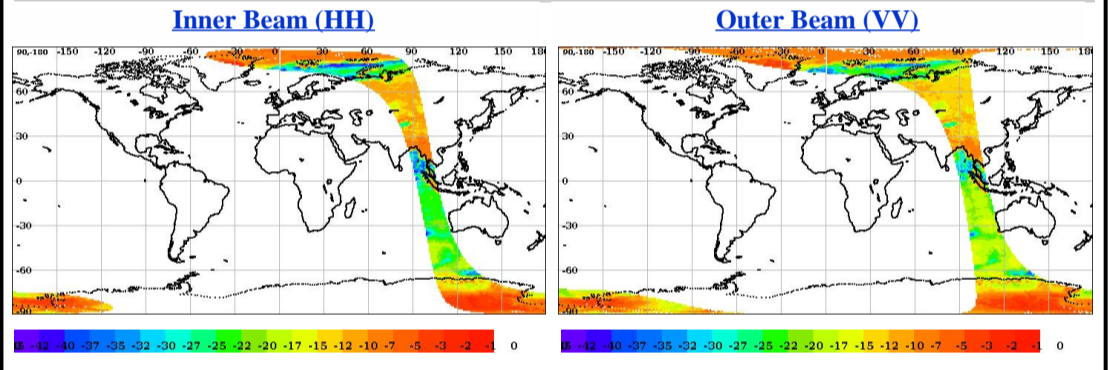
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



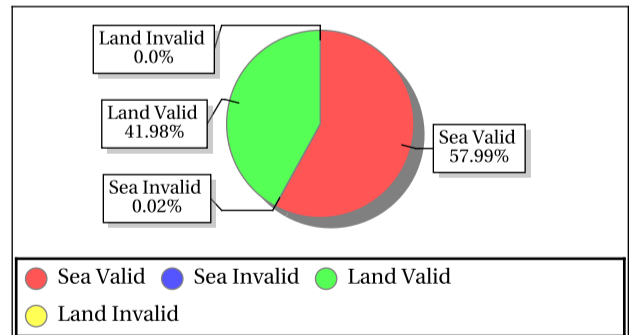
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.02	0.03
Data Not Available From Payload (%)	98.86914	88.31058
Slice not within sample array limits (%)	1.13	11.69
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.22	13.34
Noise samples for blending Saturated	0.0	0.049654
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 (%)	0.028345	0.061153

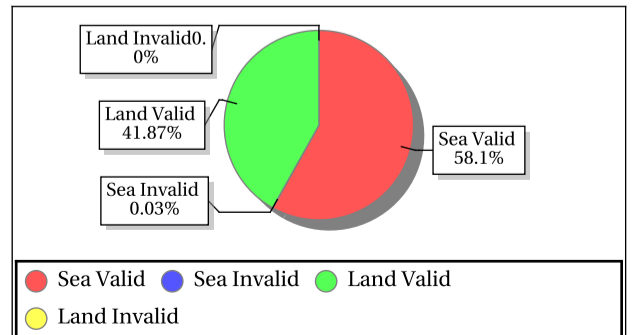
\*DP Format Document

## 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	-8.93	-5.79	-7.12	0.90	170.19	205.52	185.62	10.37
ANT_1	-75.00	121.00	Inner	ASC	Fore	-7.52	-5.65	-6.63	0.55	179.41	206.18	191.83	8.91
ANT_1	-75.00	121.00	Outer	ASC	Aft	-9.06	-7.49	-8.12	0.41	180.65	217.85	199.13	11.81
ANT_1	-75.00	121.00	Outer	ASC	Fore	-9.28	-7.01	-8.14	0.78	193.93	238.31	207.43	15.68
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-4.65	-4.65	-4.65	0.00	228.84	228.84	228.84	0.00



## 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	306.41	0.29	2.223	0.12	245.56	0.28	2.033	0.12	1.00	0.12	0.000	0.12	1.73	0.12	0.002
<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>	-35.00	23.94	5.73	0.065	-34.04	24.53	6.19	1.473	-9.71	28.91	18.28	14.894	-12.30	29.70	18.64	16.692

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	193.16	0.25	2.286	0.09	226.91	0.26	2.423	0.09	11.59	0.09	0.077	0.09	9.30	0.09	0.017
<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	0.02	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>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>	-34.16	16.19	3.46	0.000	-34.86	17.97	3.80	0.000	-21.92	23.10	12.28	0.067	-20.96	23.43	12.44	0.217

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>	48.74	49.44	49.05	0.000	57.40	58.24	57.93	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	32.56	1.27	2.576	0.0000	297.97	1.27	3.813	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1031.45	1077.06	1051.22	0.000	1208.85	1265.42	1233.39	0.507	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-92.34	-89.96	-90.49	0.000	-95.03	-92.00	-92.22	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.55	16.37	15.75	0.000	4.16	54.83	20.88	10.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.76	20.70	19.75	0.000	8.05	36.11	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

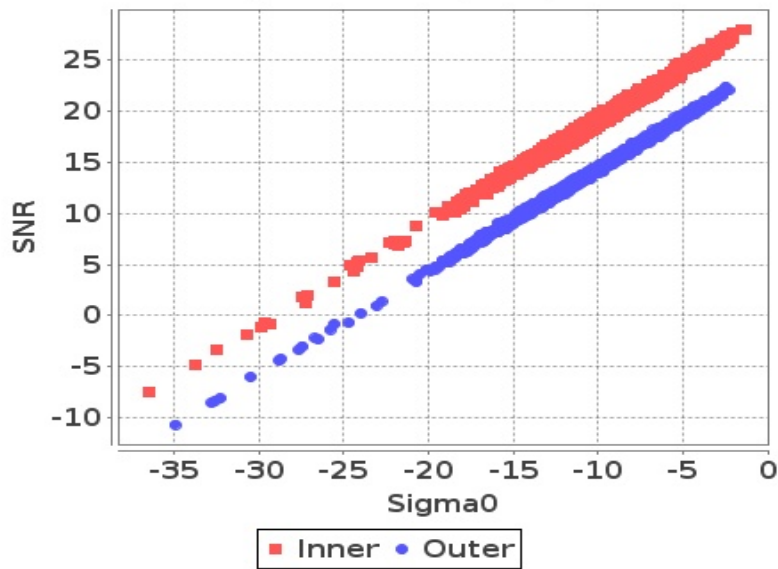
- Normal
- Deviations
- Alarming
- High Errors



# Sigma0 Behaviour (Sigma0 Vs SNR)

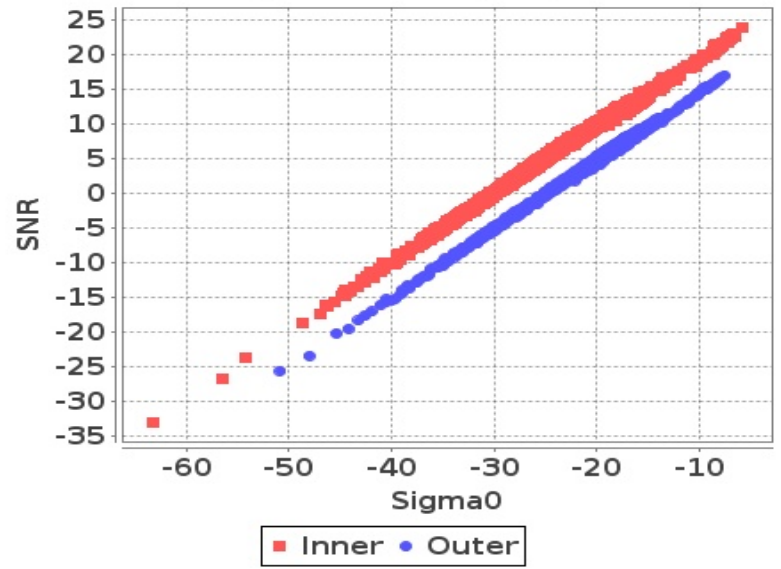
## Footprint-Land

### Sigma0 Vs SNR (Land)



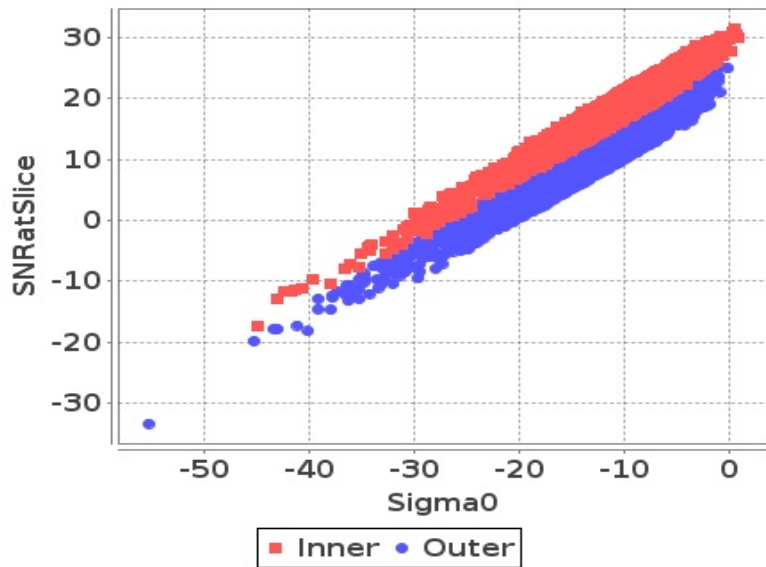
## Footprint-Sea

### Sigma0 Vs SNR (Sea)



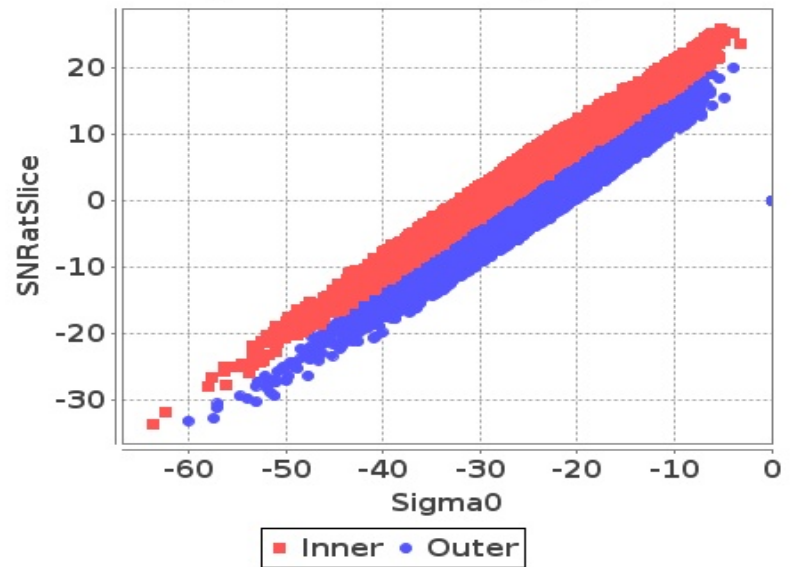
## Slice-Land

### Sigma0 Vs SNRatSlice (Land)



## Slice-Sea

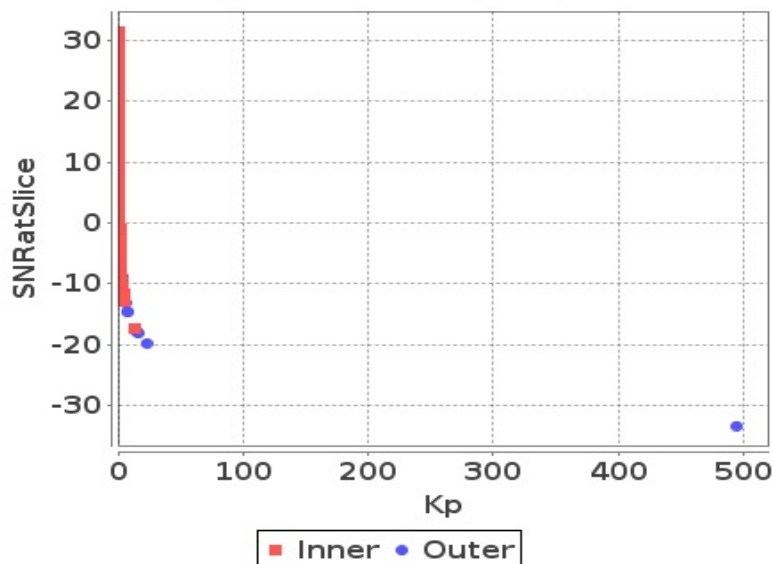
### Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

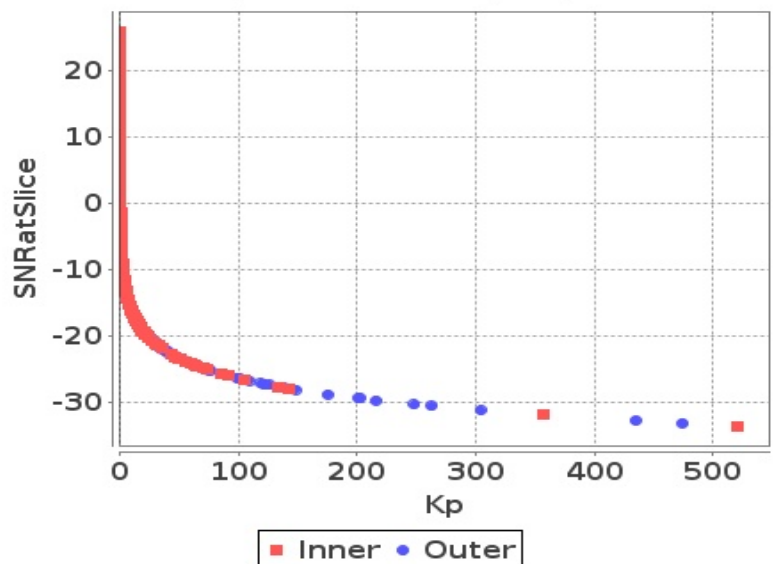
## Slice

### Kp Vs SNRatSlice (Land)



## Slice

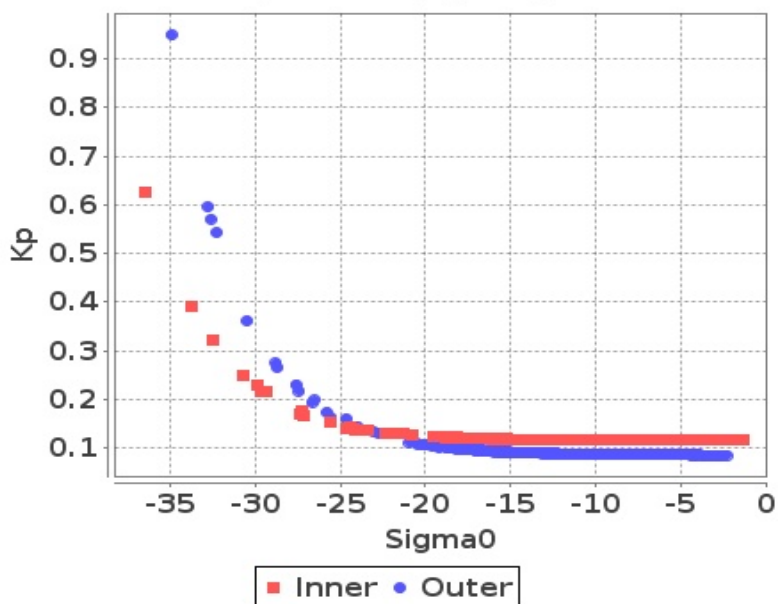
### Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

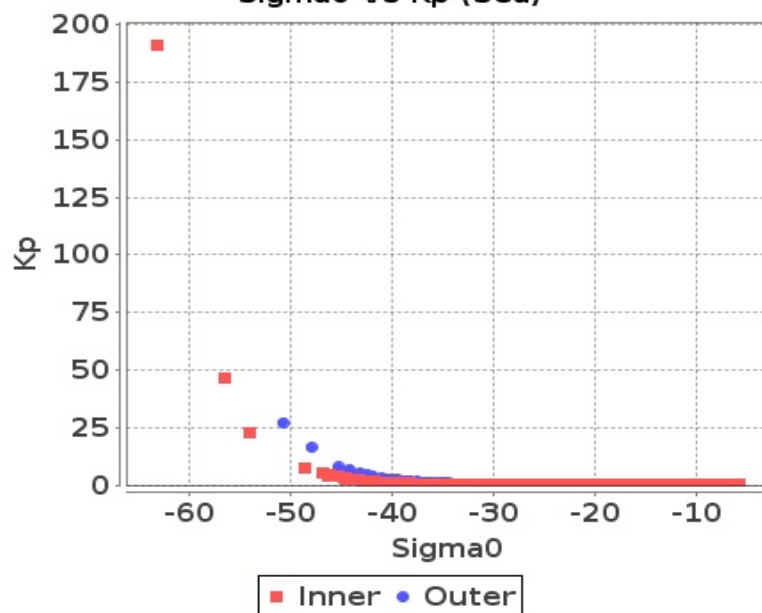
## Footprint-Land

### Sigma0 Vs Kp (Land)



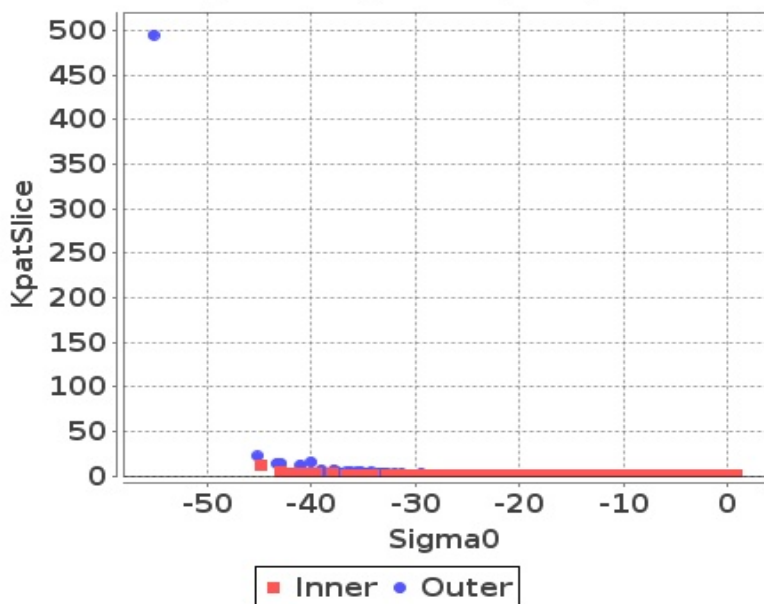
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



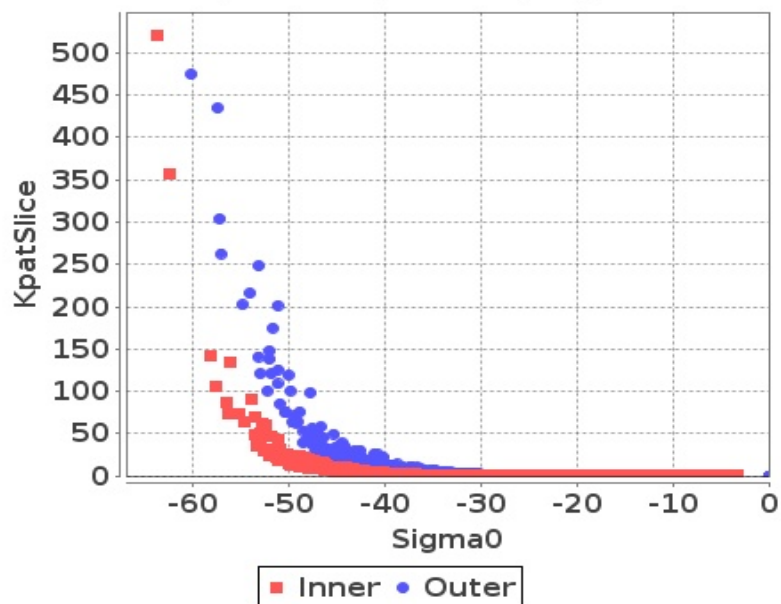
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

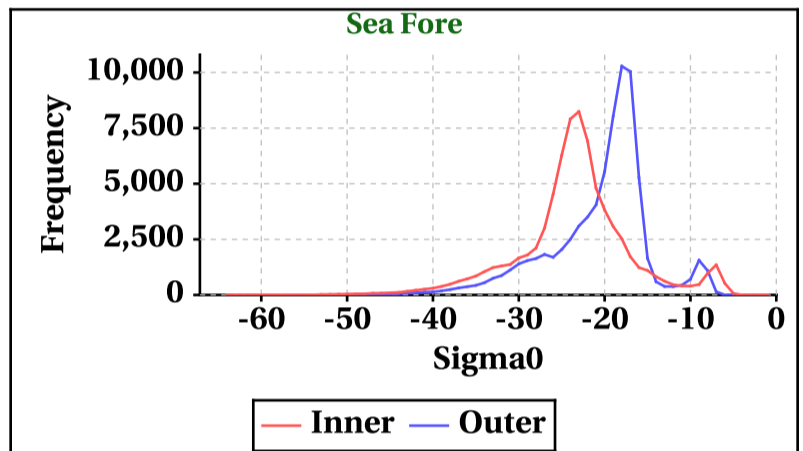
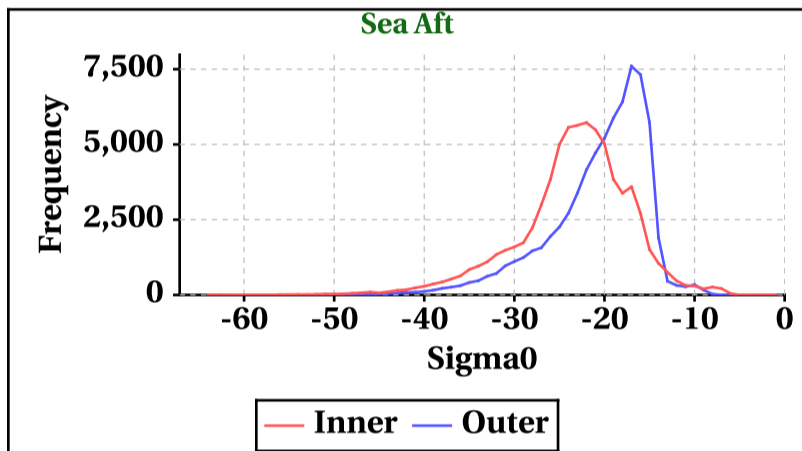
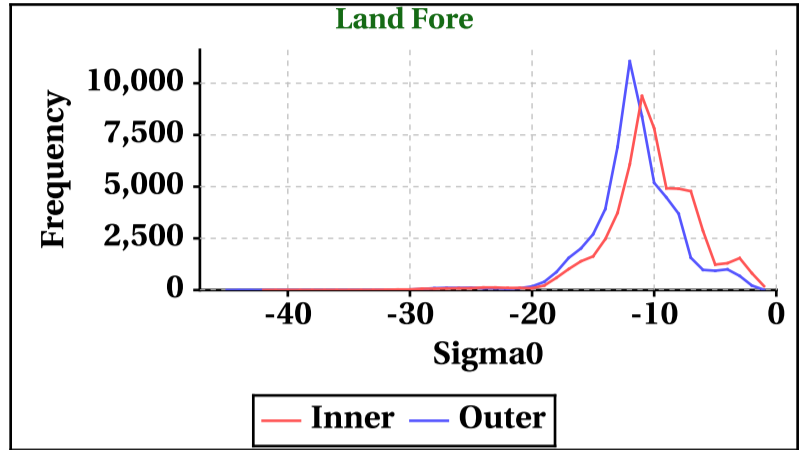
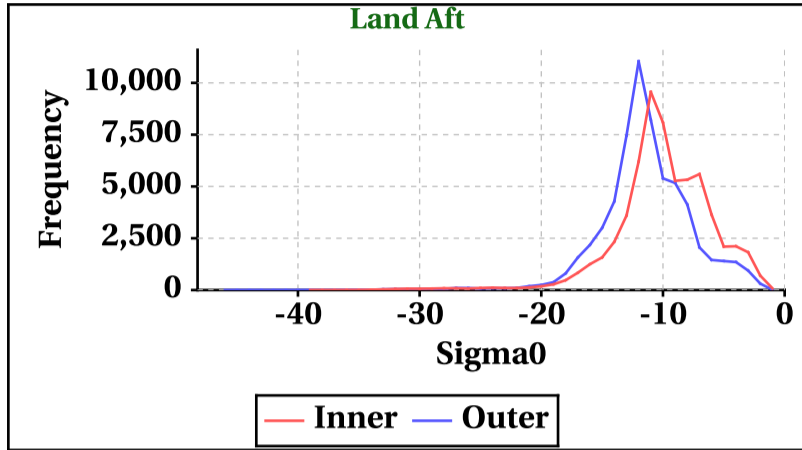


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-39	-42	-64	-64
Max	0	0	0	0

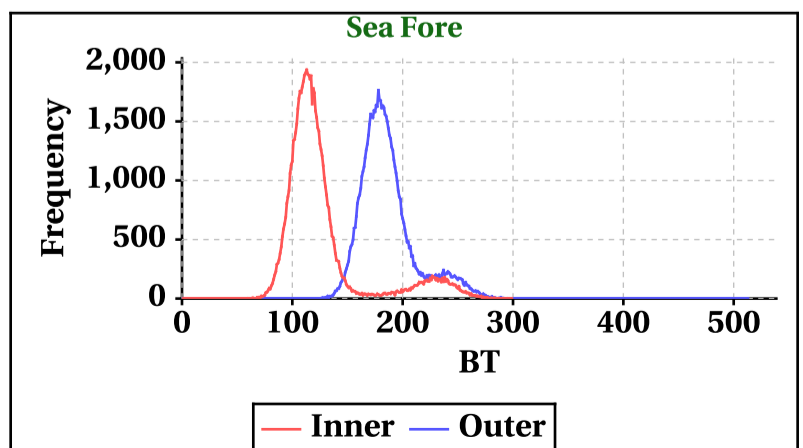
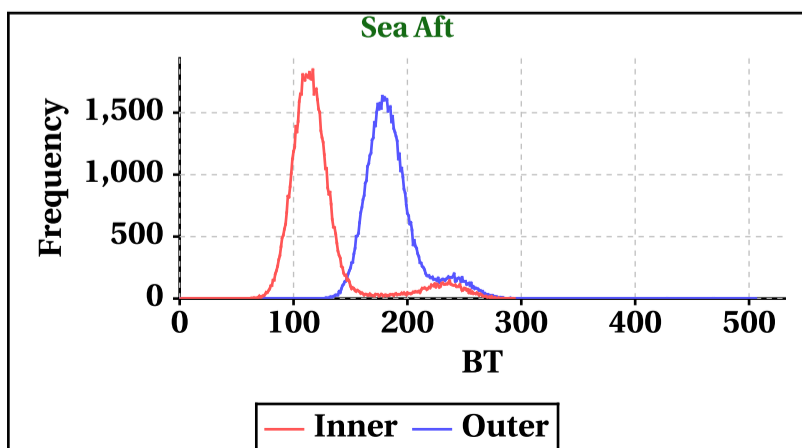
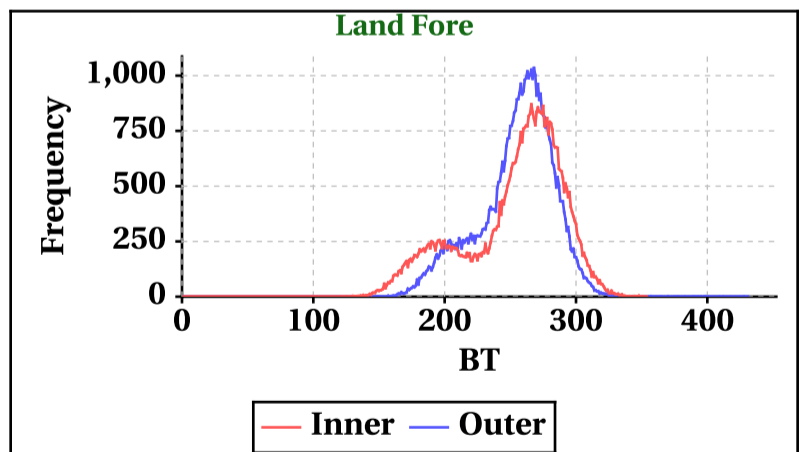
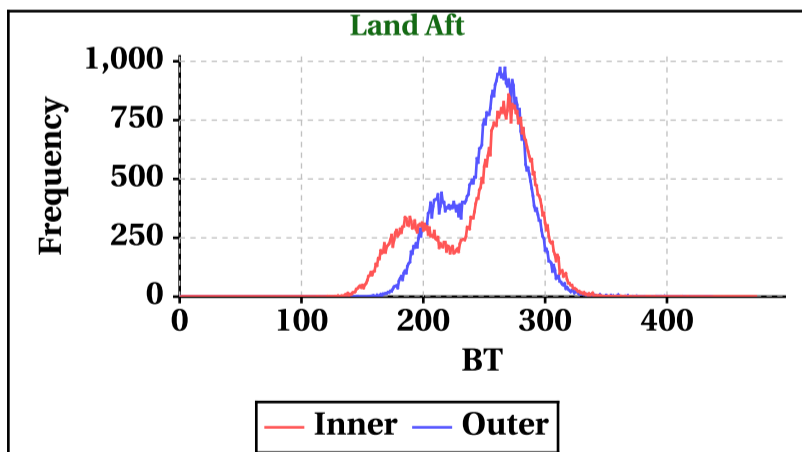
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-46	-45	-58	-60
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	473	354	294	299

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	437	431	506	513

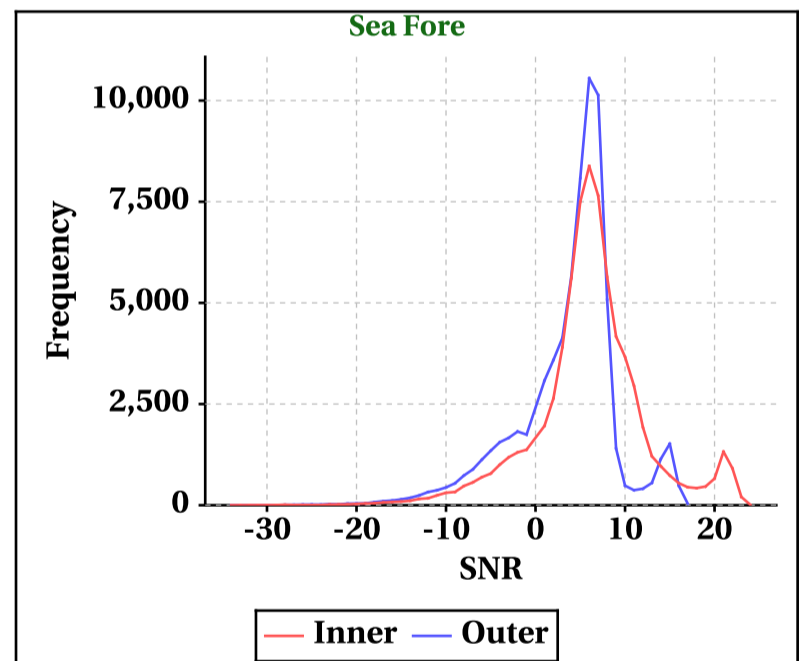
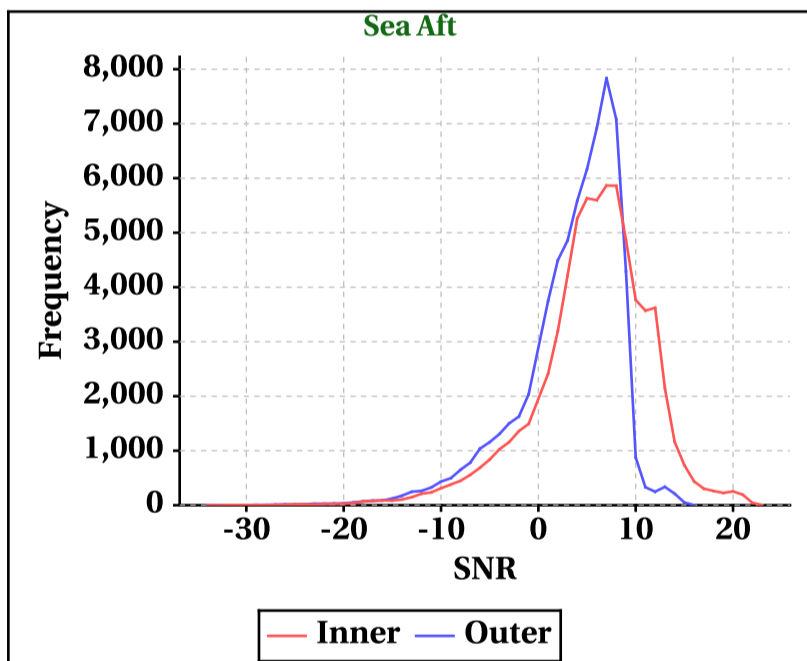
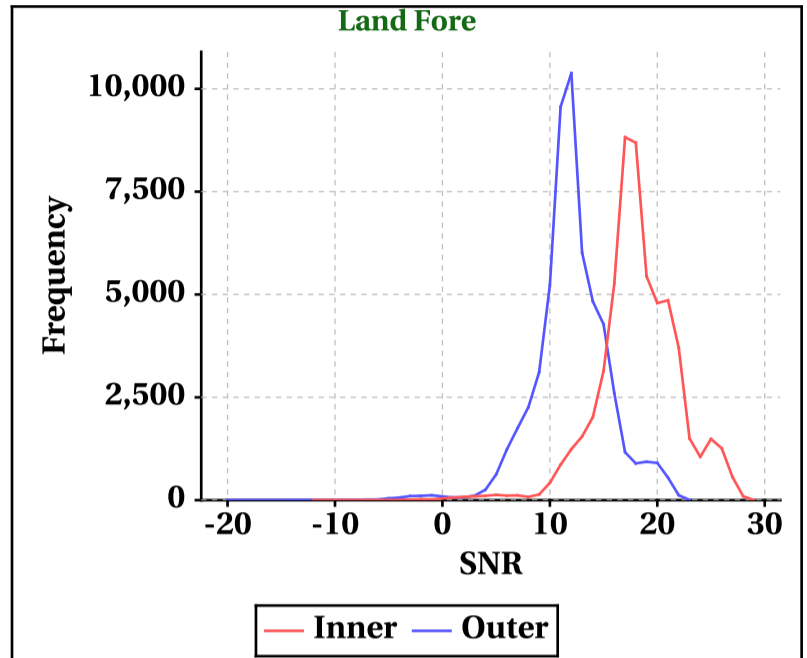
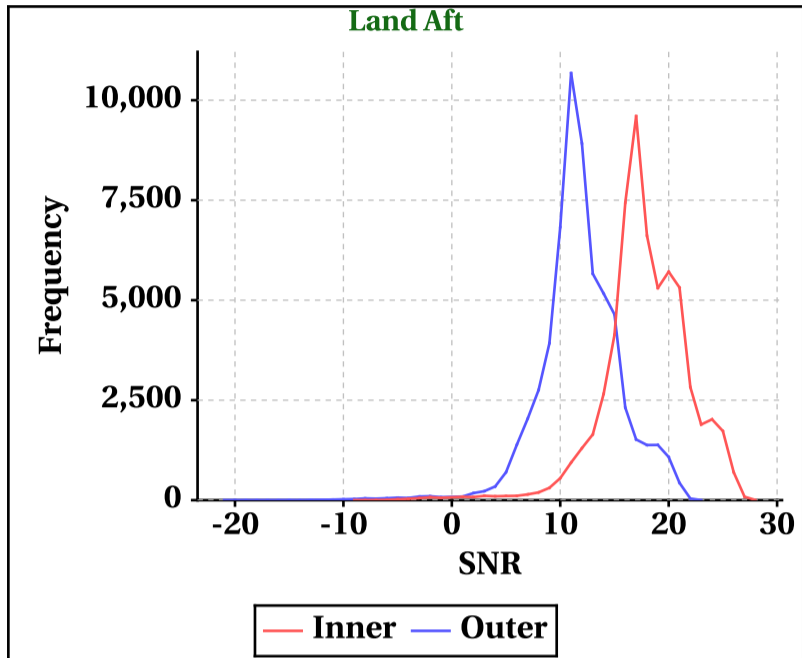


# Dynamic Range (Data Histograms)

## SNR(dBm)

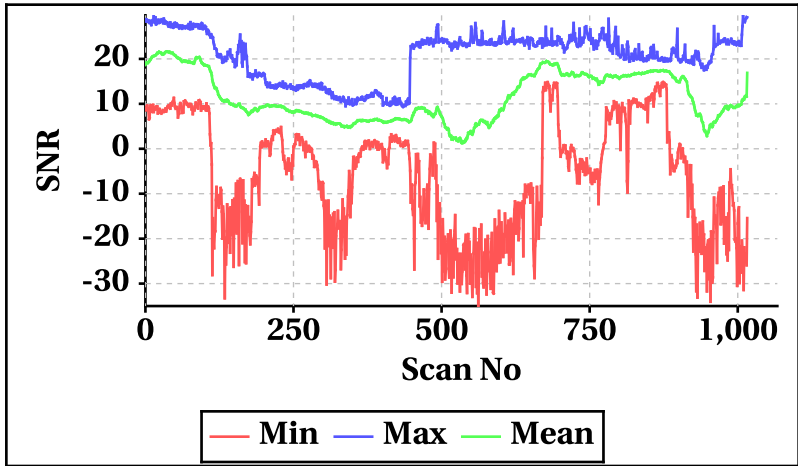
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-9	-12	-34	-34
Max	28	29	23	24

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-21	-20	-34	-34
Max	23	23	16	17

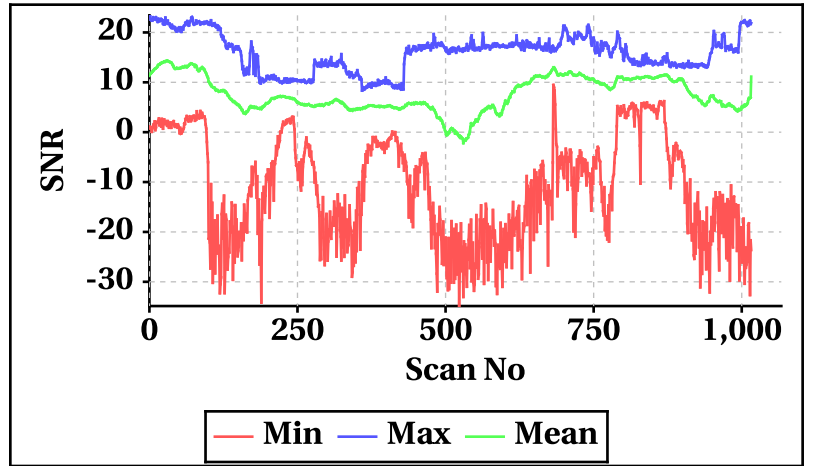


## Orbit-wise behaviour of SNR

Inner Beam (HH)

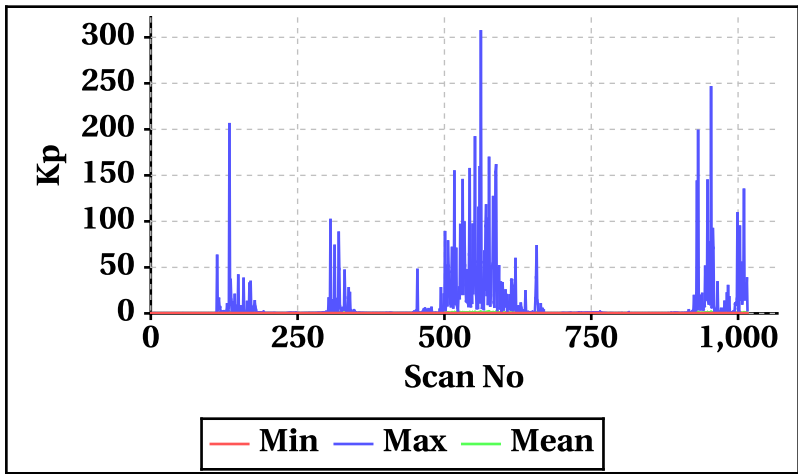


Outer Beam(VV)

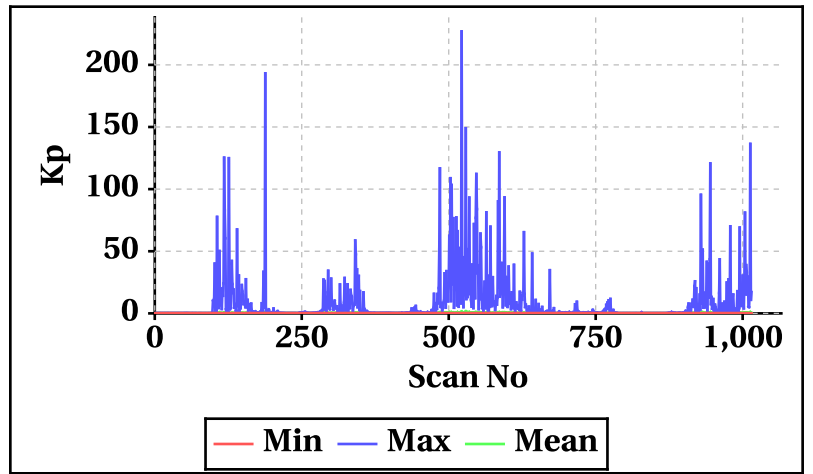


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

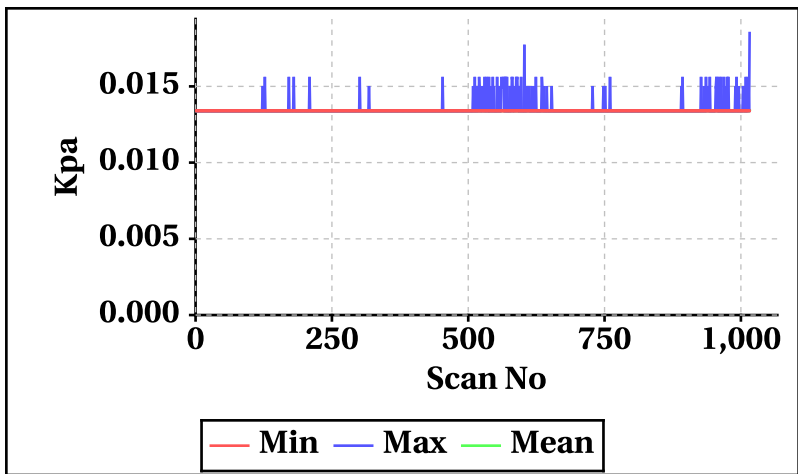
Inner Beam(HH)



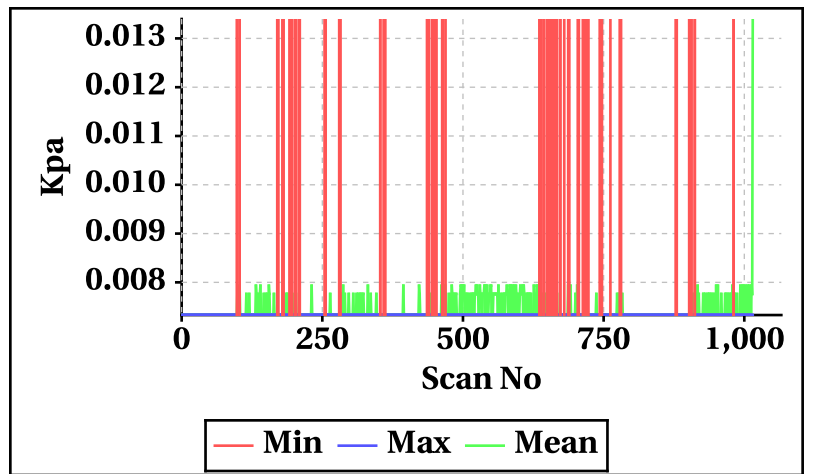
Outer Beam(VV)



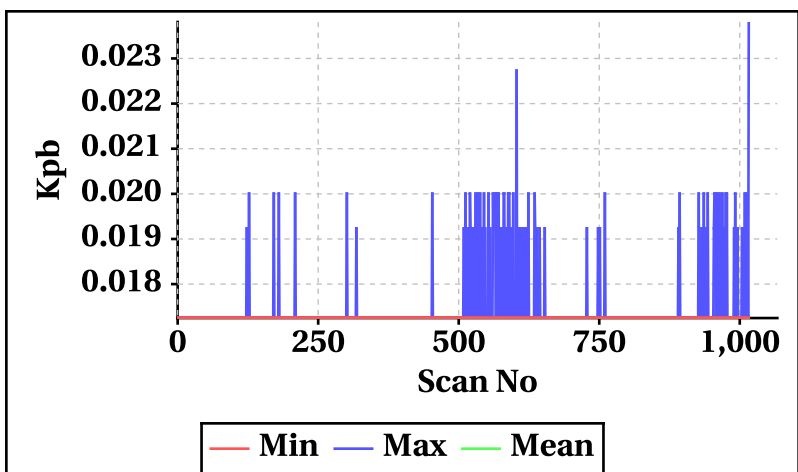
Inner Beam(HH)



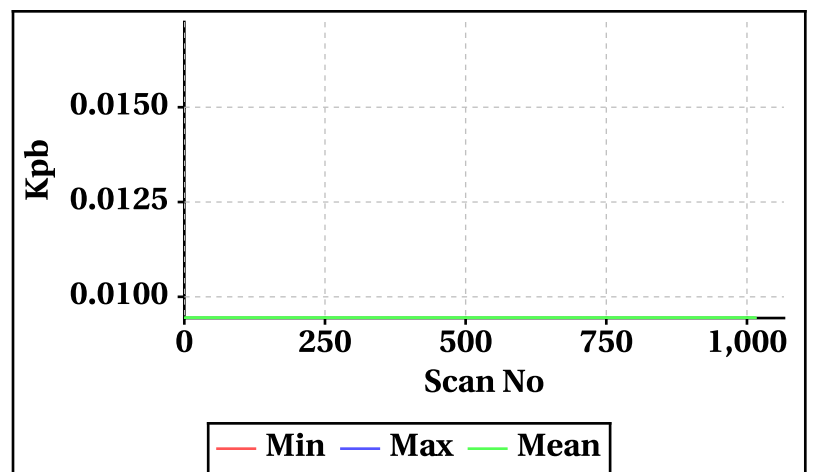
Outer Beam(VV)



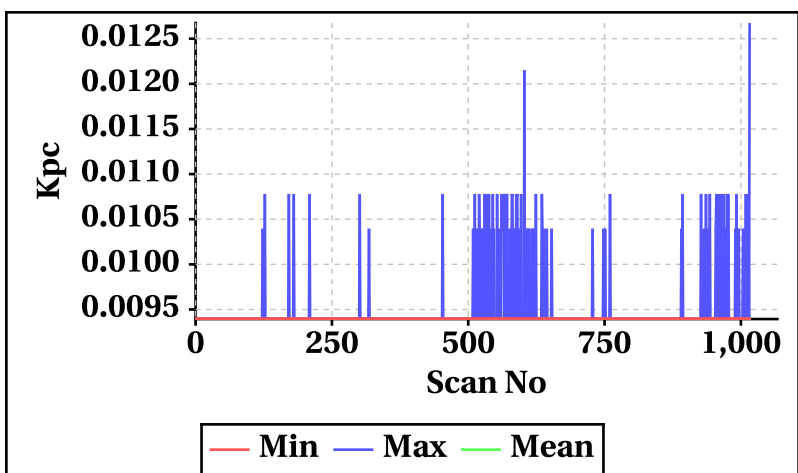
Inner Beam(HH)



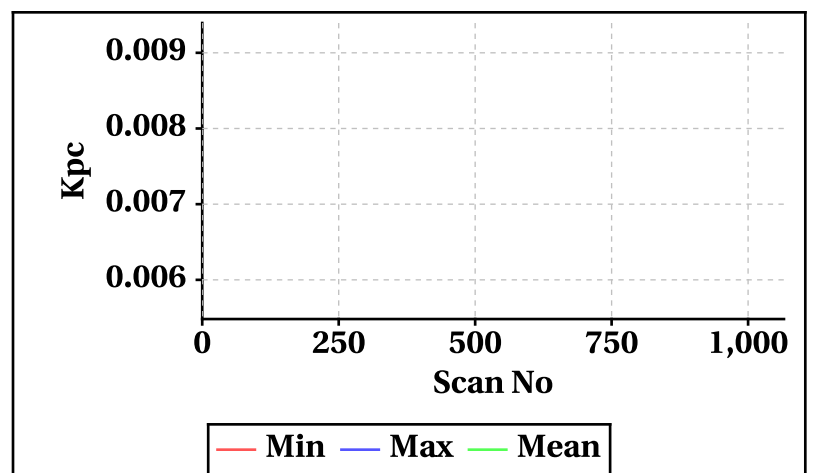
Outer Beam(VV)



Inner Beam(HH)



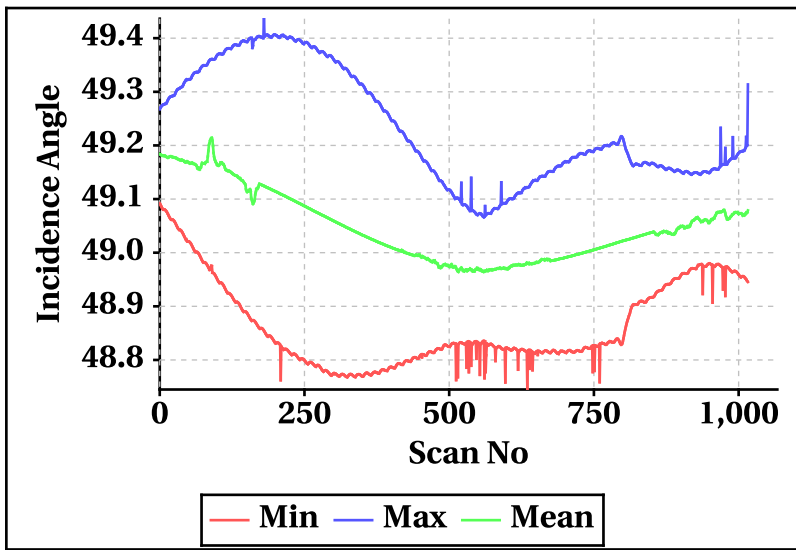
Outer Beam(VV)



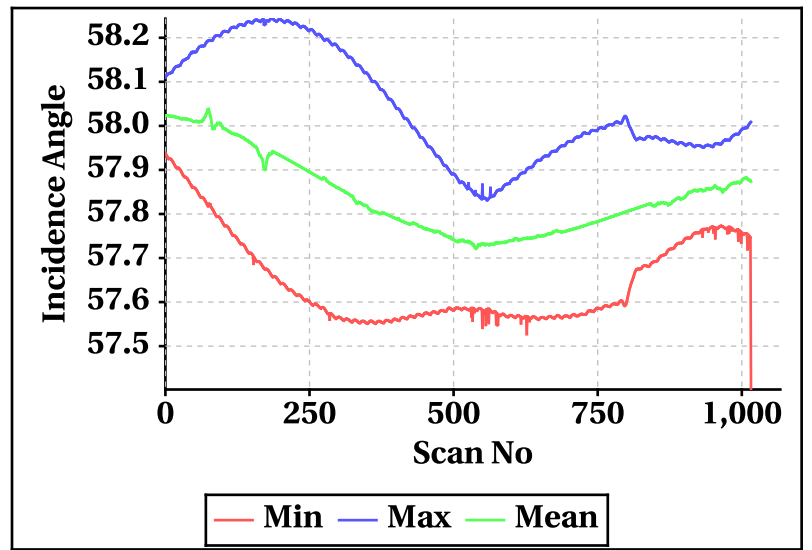


# Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

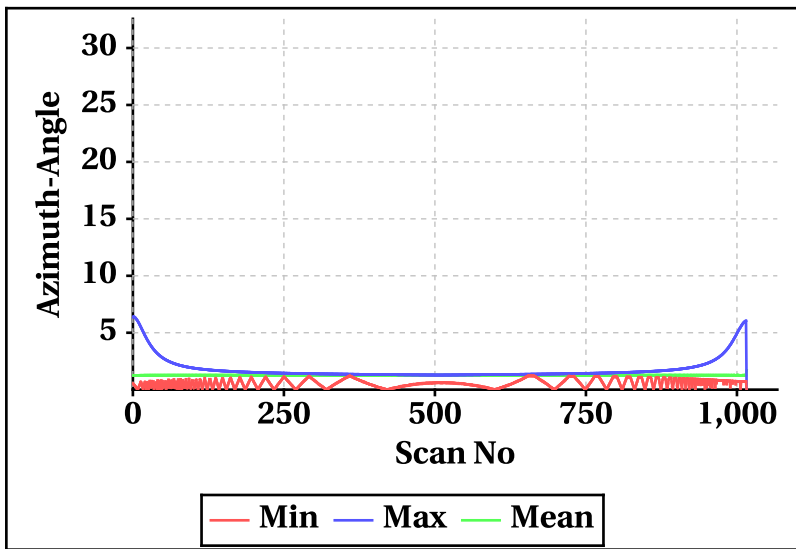
**Inner Beam (HH)**



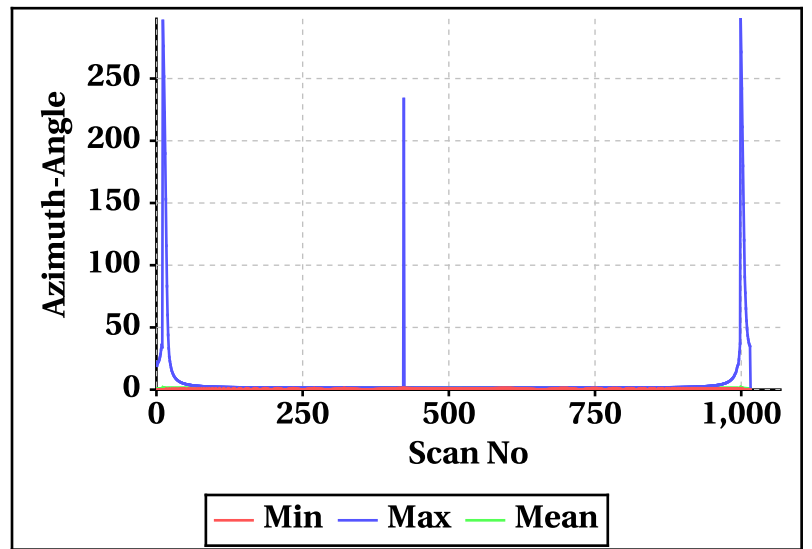
**Outer Beam(VV)**



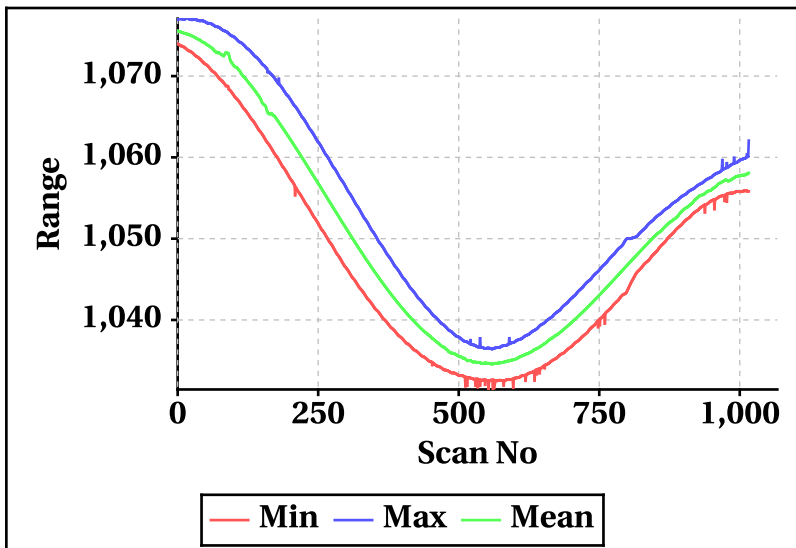
**Inner Beam (HH)**



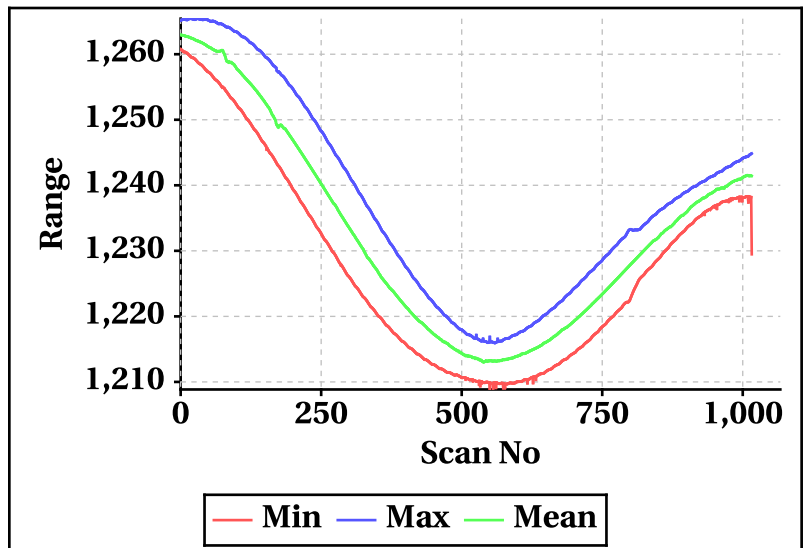
**Outer Beam(VV)**



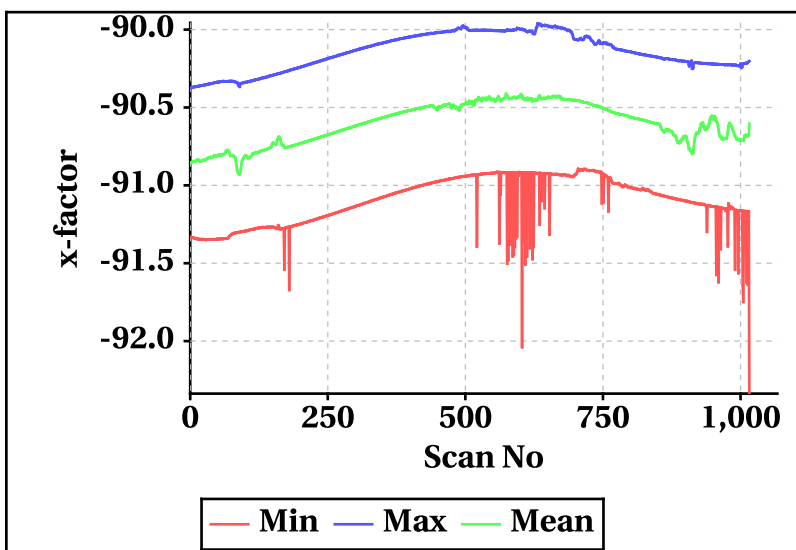
**Inner Beam (HH)**



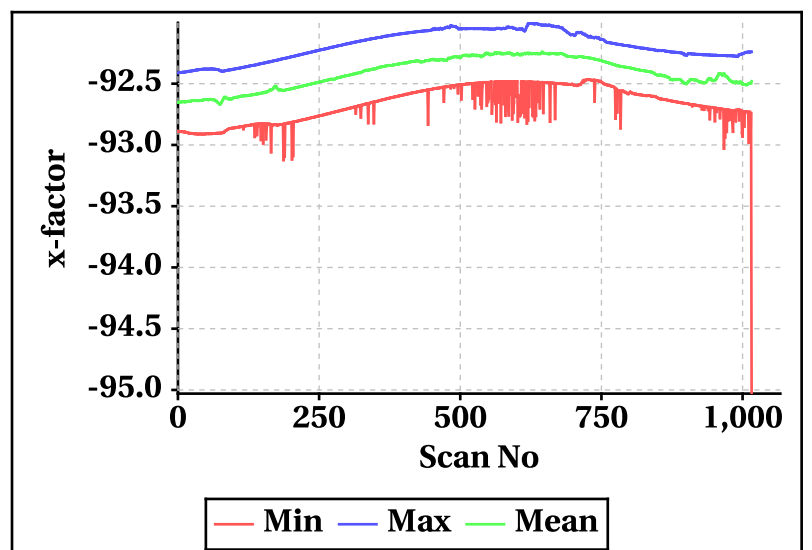
**Outer Beam(VV)**



**Inner Beam (HH)**



**Outer Beam(VV)**

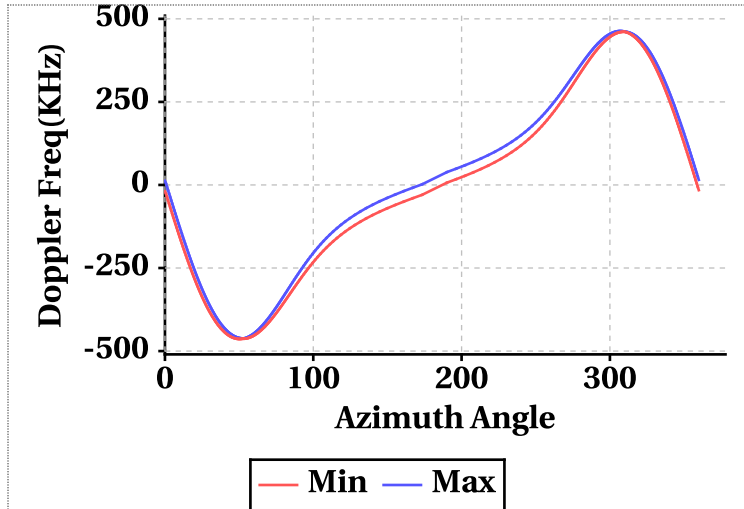


# Doppler Frequency Variation

**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>	463.24	519.20

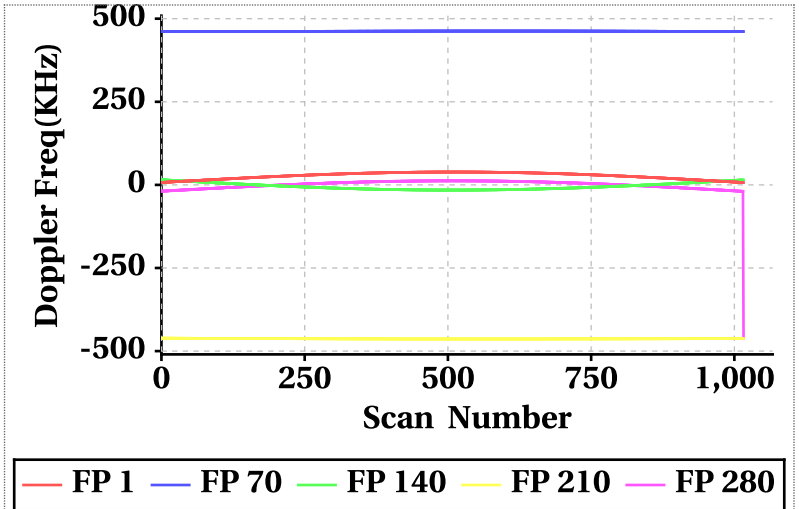
**Footprint wise Doppler frequency variation Inner Beam (HH)**



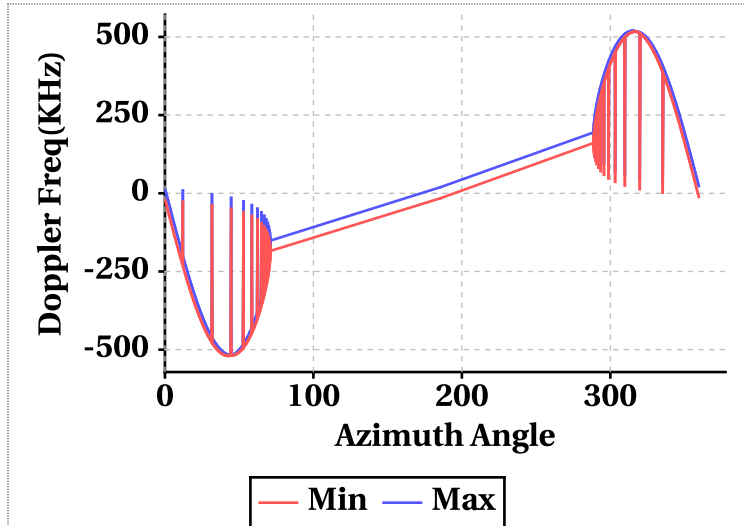
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	6.94	38.66	27.20	2.32	37.72	24.92
Doppler_70	460.94	462.76	462.05	516.54	518.88	518.01
Doppler_140	-15.62	15.40	-4.41	-23.32	11.48	-10.73
Doppler_210	-463.58	-461.22	-462.86	-519.34	-517.08	-518.65
Doppler_280	-462.84	12.28	0.34	-518.60	19.68	6.33

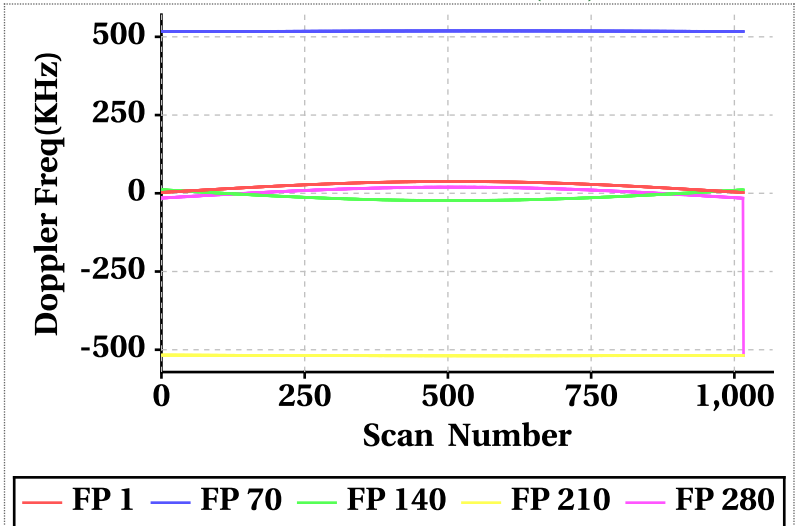
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

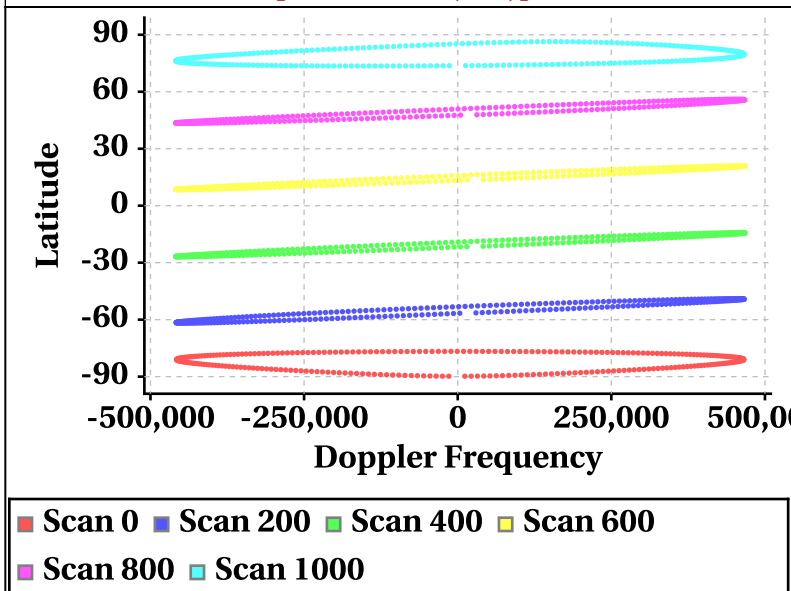


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

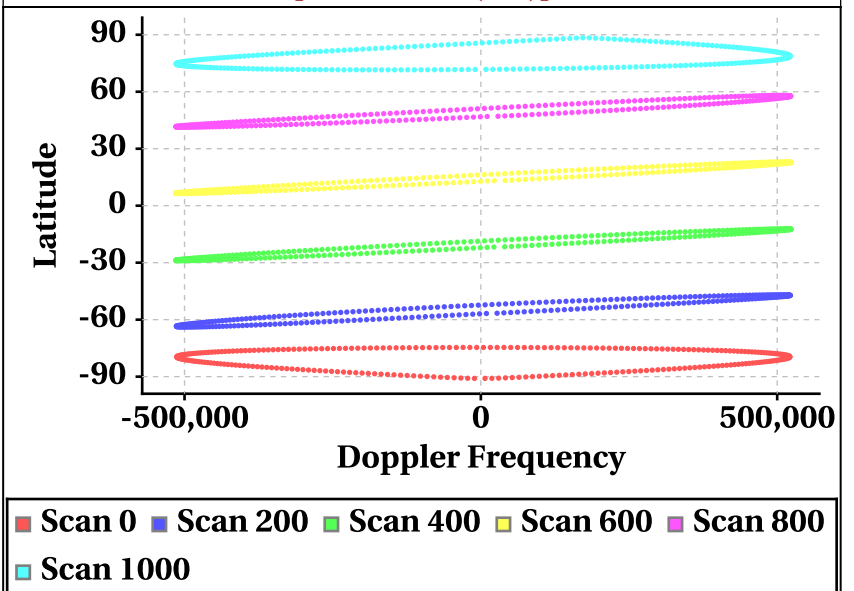


## Latitude Vs Doppler Frequency

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



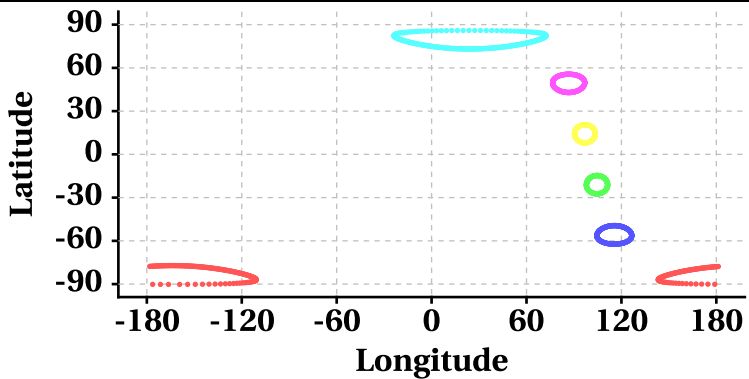
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

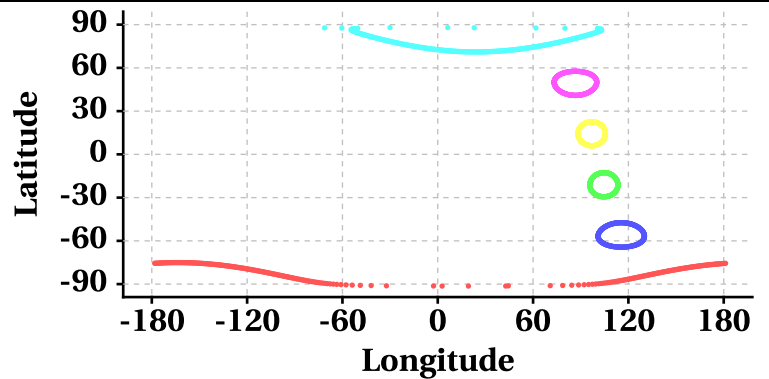
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

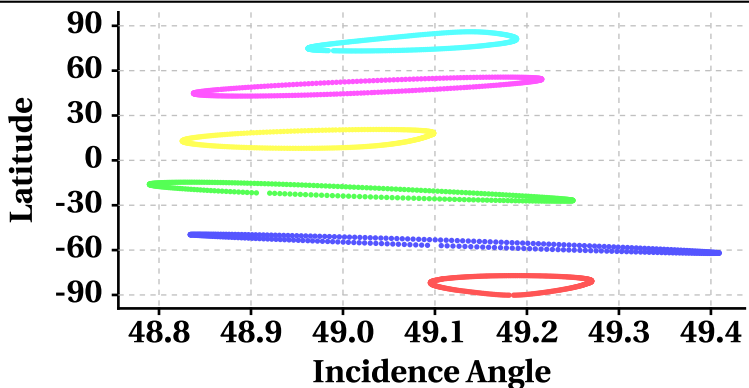
Scan Trace [Outer Beam (VV)]



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

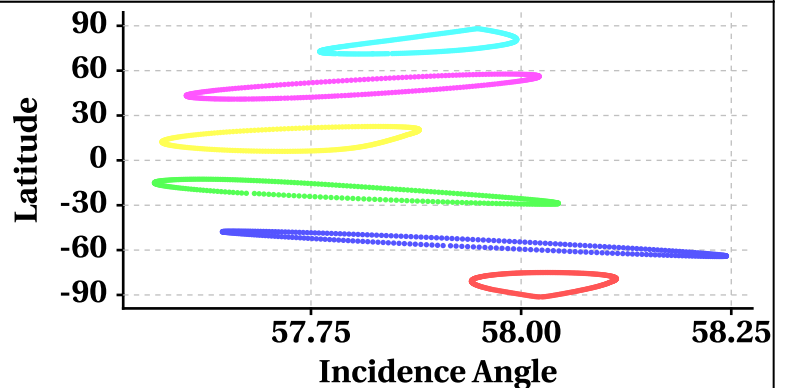
## Latitude Vs Incidence Angle

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



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

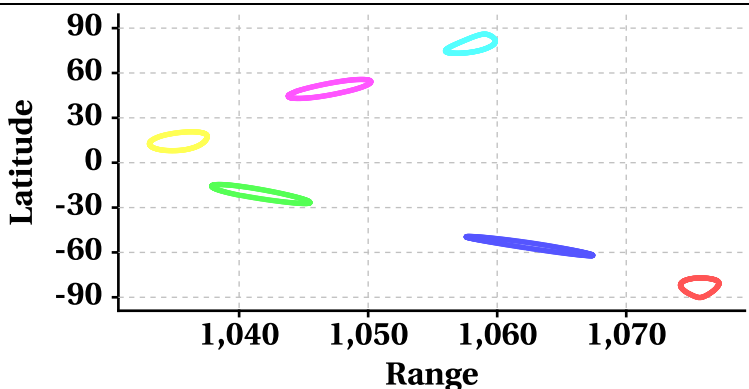
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

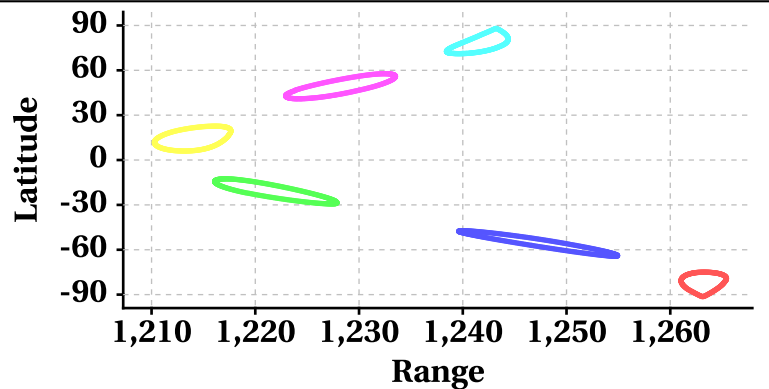
## Latitude Vs Range

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

