

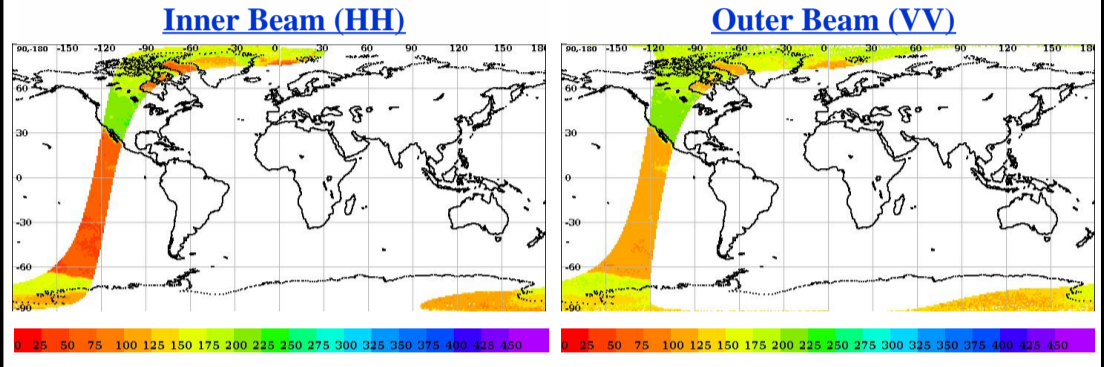
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

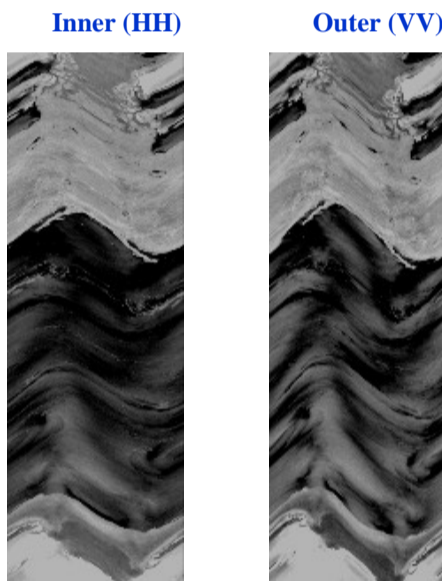
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along 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>	14666	<b>Total Scans</b>	1016
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	14667	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	14666_14667	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	04-07-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	04-07-2019	<b>Equator Crossing Time</b>	16:25:55.000	<b>No Of Outer Slices</b>	15

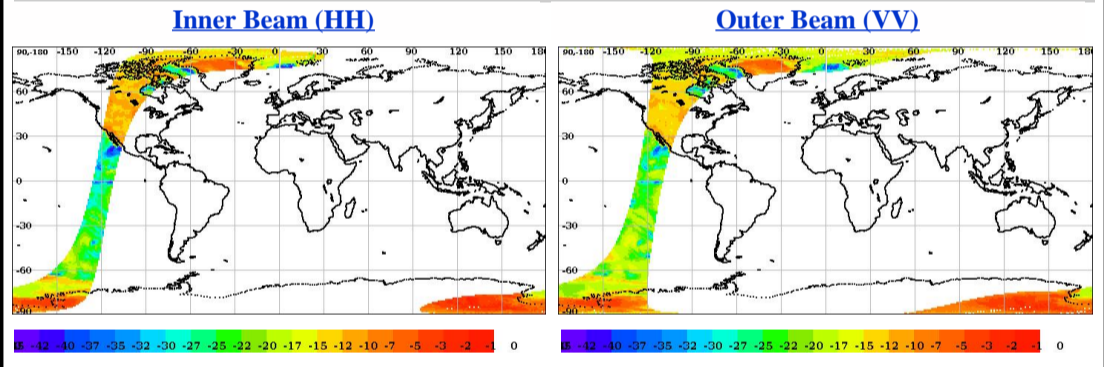
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



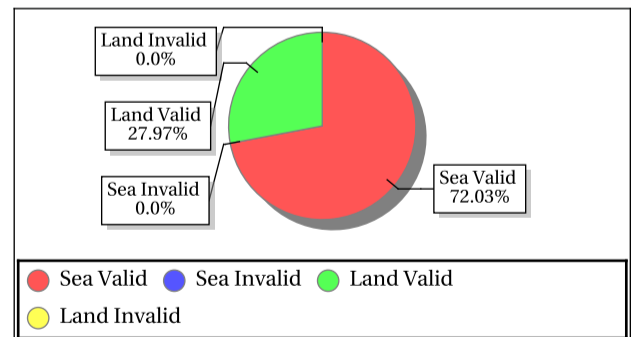
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.00	0.00
Data Not Available From Payload (%)	100.0	100.0
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	13.34
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 (%)	0.024516	0.054252

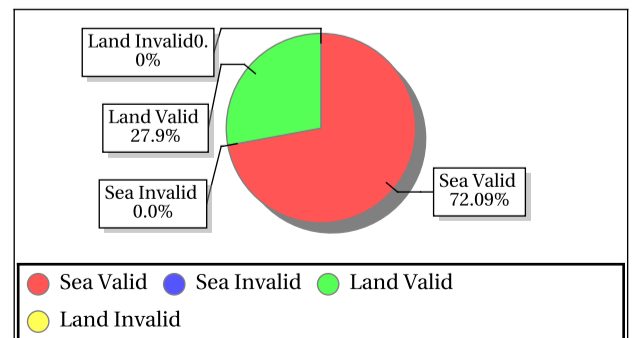
\*DP Format Document

## 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
GreenLand_2	77.50	-41.50	Inner	DSC	Aft	-6.43	-4.14	-5.22	0.73	101.56	134.99	119.75	11.80
GreenLand_1	74.69	-42.50	Inner	DSC	Aft	-10.07	-7.40	-9.09	0.72	116.94	166.76	142.54	11.21
GreenLand_1	74.69	-42.50	Inner	DSC	Fore	-10.52	-7.35	-9.17	0.69	100.67	162.09	136.14	13.98
ANT_1	-75.00	121.00	Outer	DSC	Fore	-8.28	-7.05	-7.36	0.46	113.66	142.98	129.72	11.57
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-5.60	-5.07	-5.41	0.22	134.25	190.73	164.93	19.16
GreenLand_1	74.69	-42.50	Outer	DSC	Aft	-10.22	-8.16	-9.23	0.69	138.67	206.15	167.14	18.24
GreenLand_1	74.69	-42.50	Outer	DSC	Fore	-9.83	-9.32	-9.49	0.20	146.54	192.30	167.67	18.22



## 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	298.25	0.25	1.575	0.12	297.51	0.24	1.448	0.12	44.53	0.12	0.003	0.12	0.56	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>	-34.88	25.97	5.48	0.010	-34.87	22.16	6.19	0.001	-26.61	29.26	17.84	11.430	-6.81	34.33	19.34	20.560

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	155.91	0.21	1.409	0.09	222.35	0.18	1.093	0.09	3.05	0.09	0.019	0.09	3.96	0.09	0.021
<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>	-33.23	14.70	3.42	0.000	-34.77	19.24	3.86	0.000	-16.06	21.79	11.87	0.000	-17.21	23.37	13.18	0.659

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)

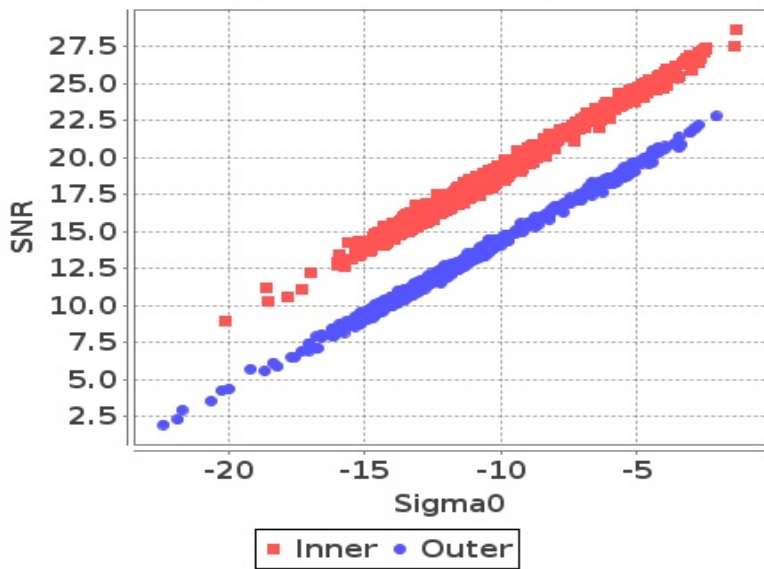
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.74	49.36	49.01	0.000	57.53	58.15	57.90	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	267.27	1.28	2.690	0.0000	299.85	1.27	3.807	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1037.78	1074.94	1053.90	0.000	1215.92	1262.53	1234.30	0.000	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.67	-90.09	-90.63	0.000	-93.12	-92.13	-92.26	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.85	16.40	16.01	0.000	10.63	37.25	21.06	4.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.86	1052.73	21.72	2.000	18.73	1392.25	22.30	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)

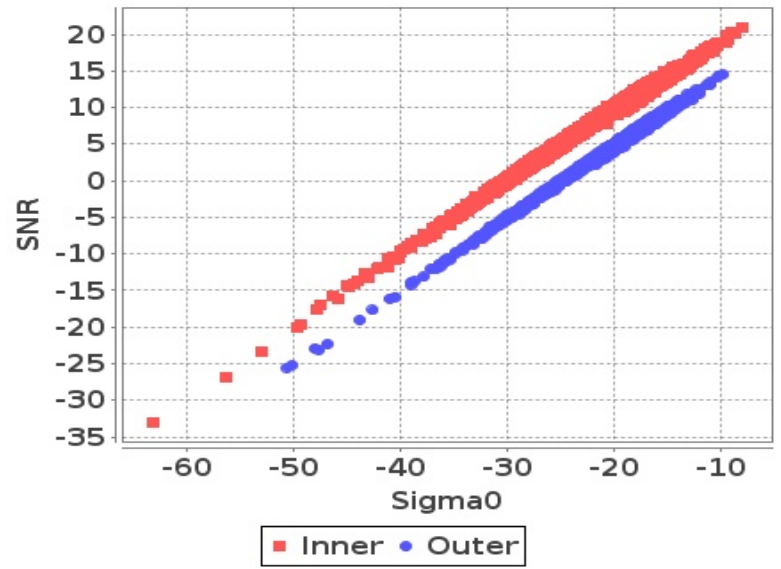
Footprint-Land

Sigma0 Vs SNR (Land)



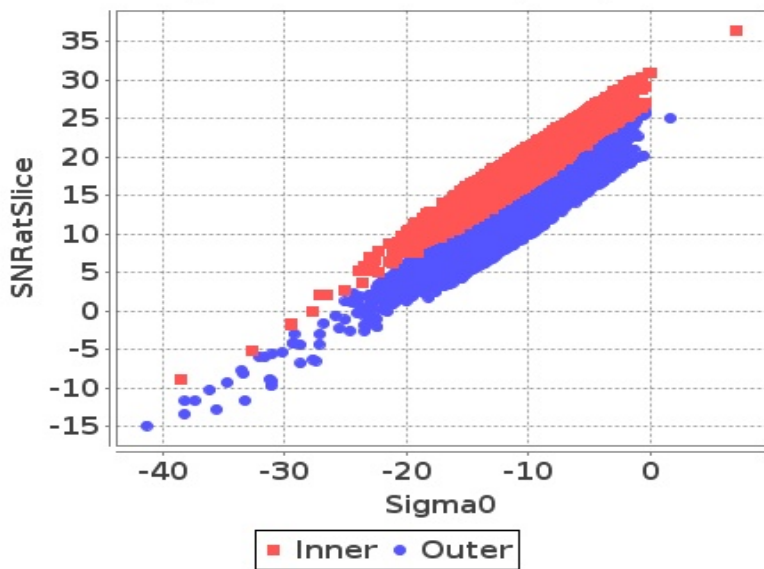
Footprint-Sea

Sigma0 Vs SNR (Sea)



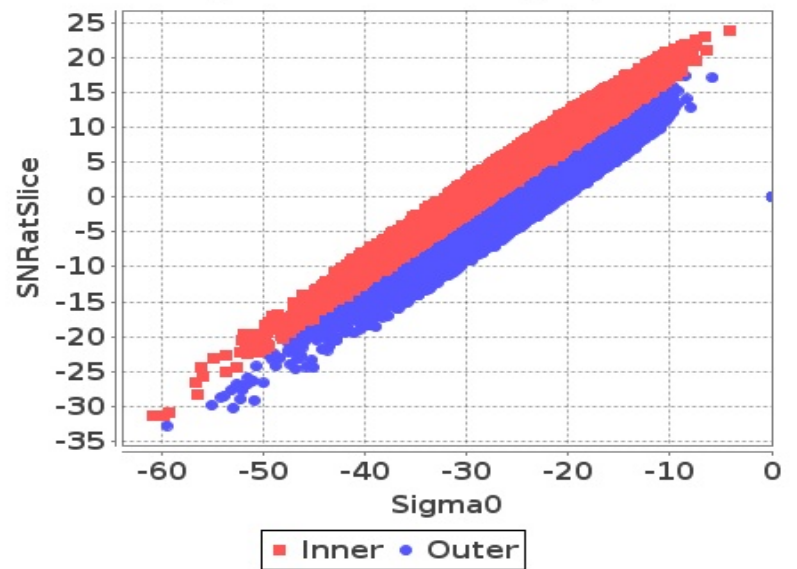
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

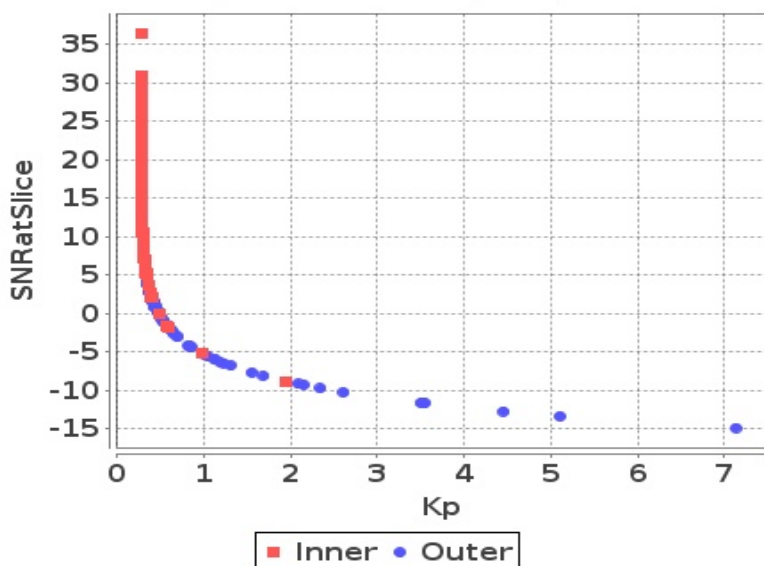
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

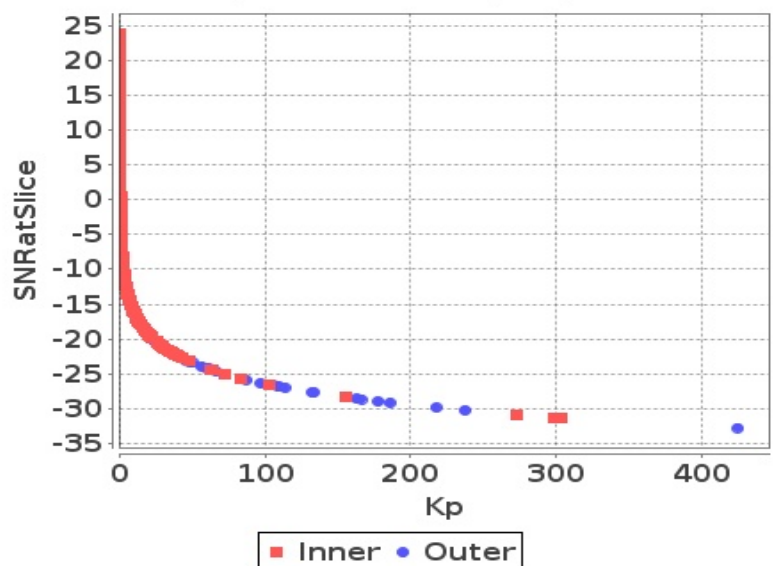
Slice

Kp Vs SNRatSlice (Land)



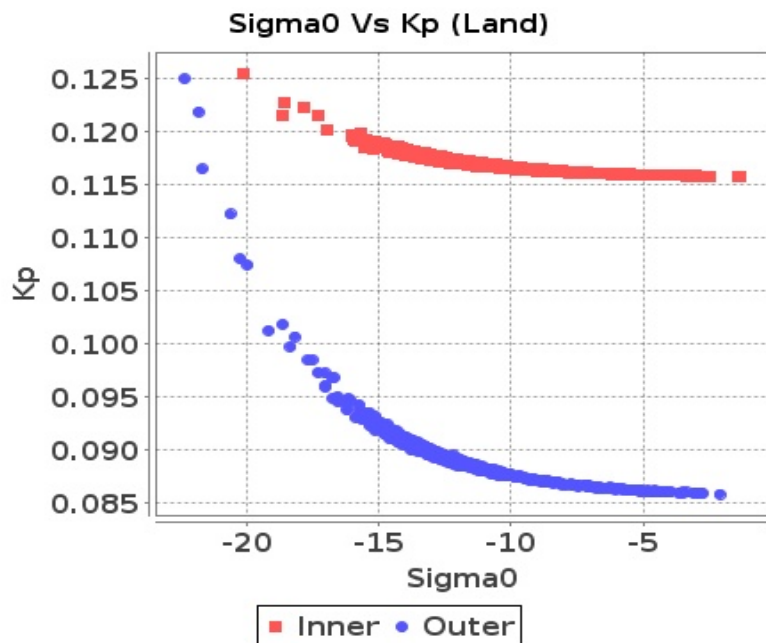
Slice

Kp Vs SNRatSlice (Sea)

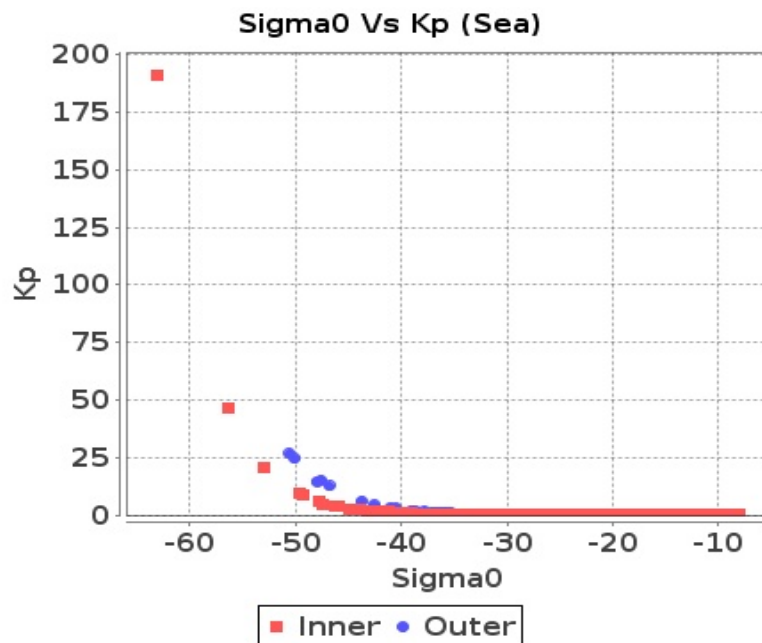


# Sigma0 Behaviour(Sigma0 Vs Kp)

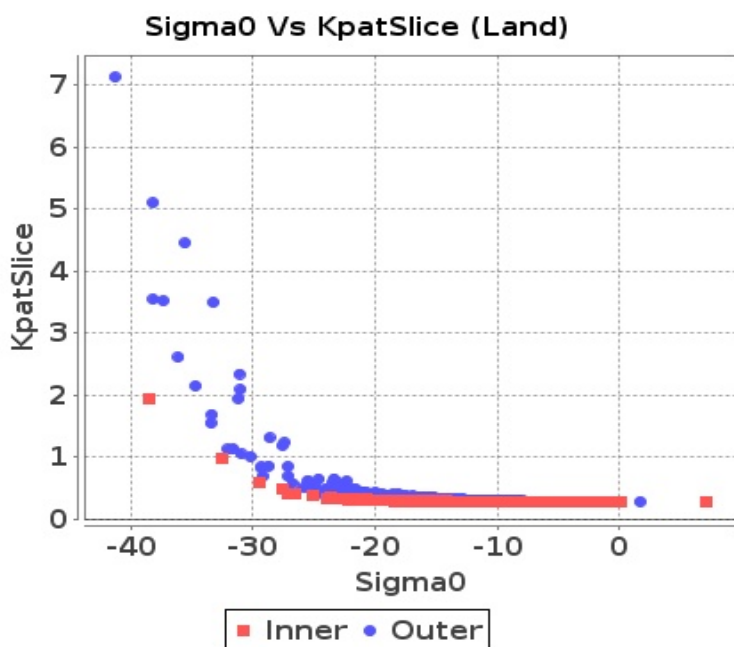
## Footprint-Land



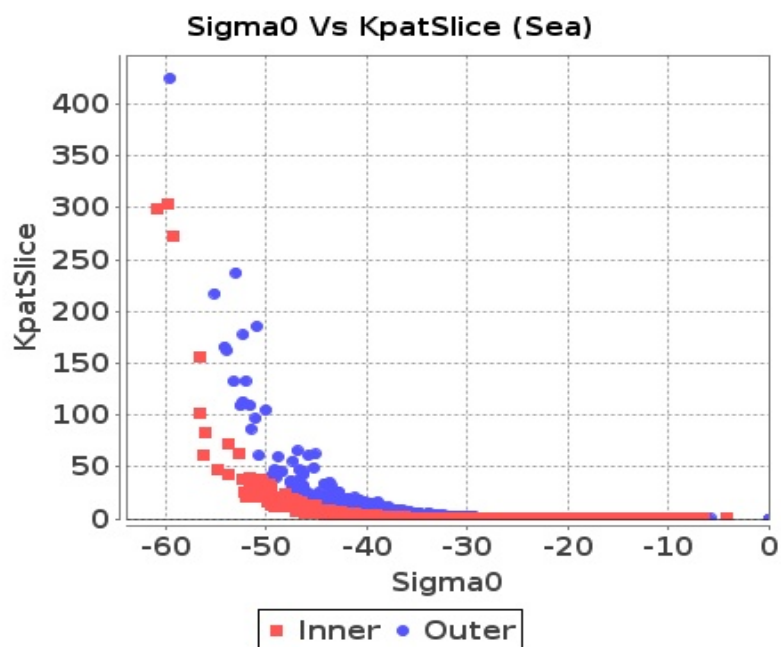
## Footprint-Sea



## Slice-Land



## Slice-Sea

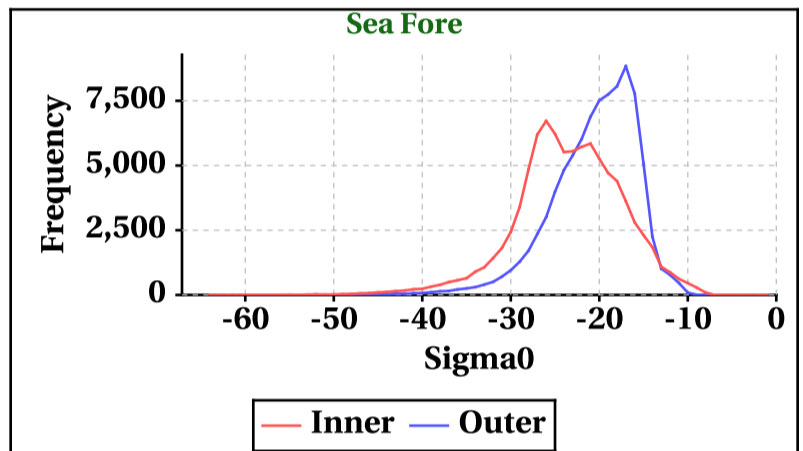
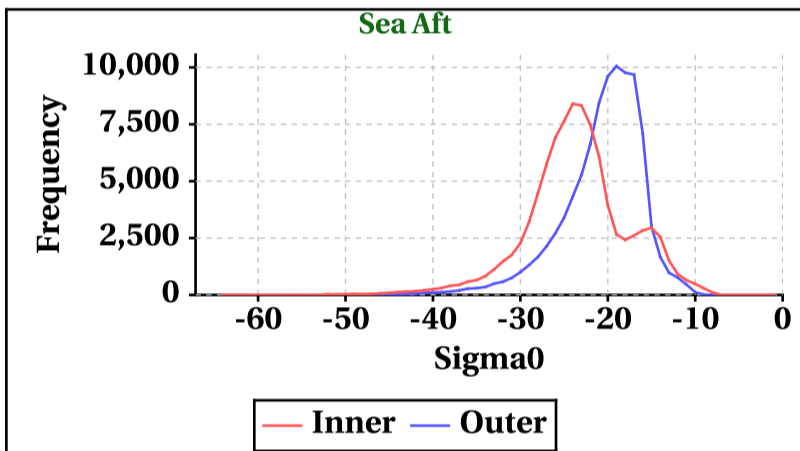
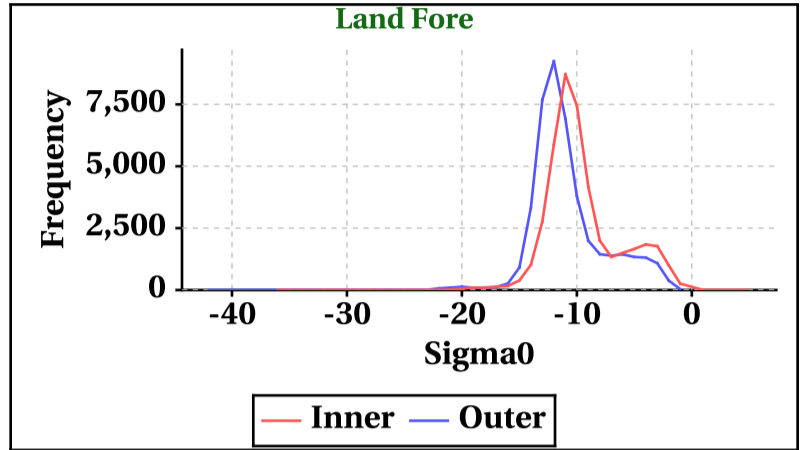
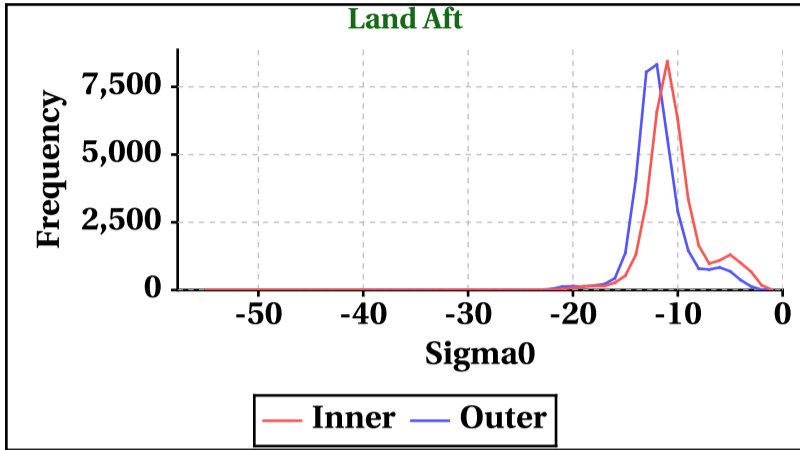


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-55	-36	-64	-64
Max	0	5	0	0

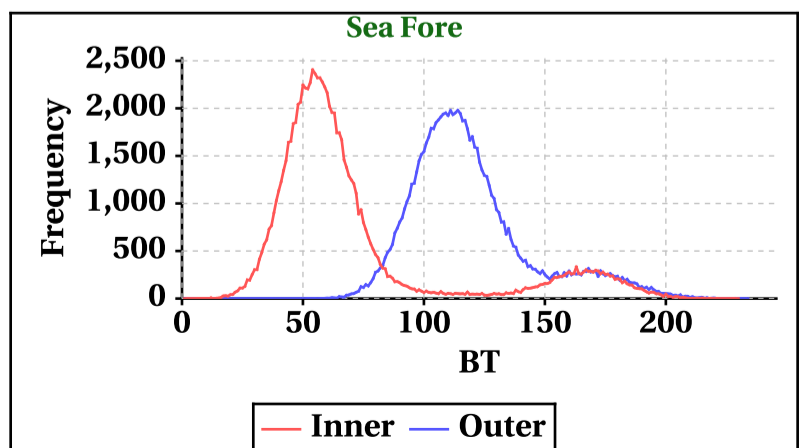
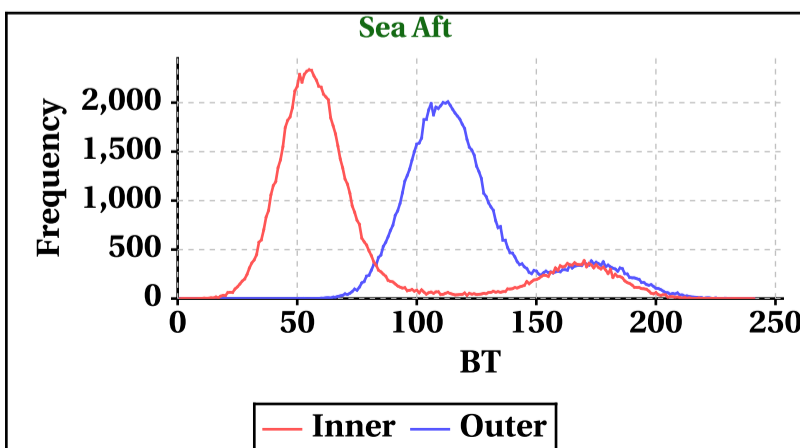
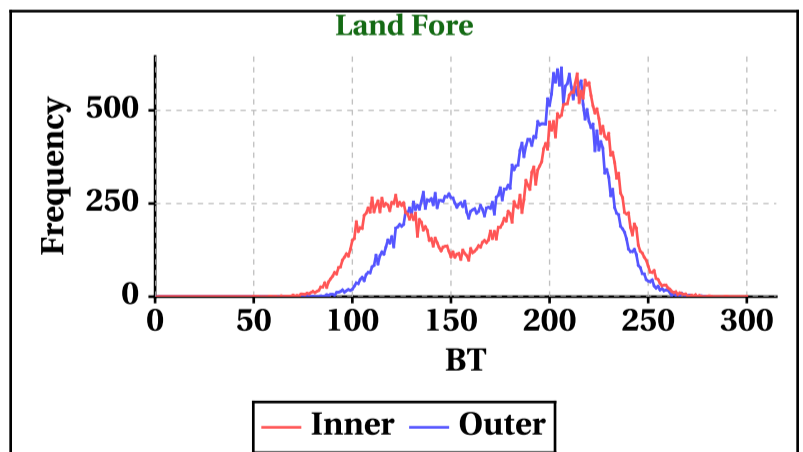
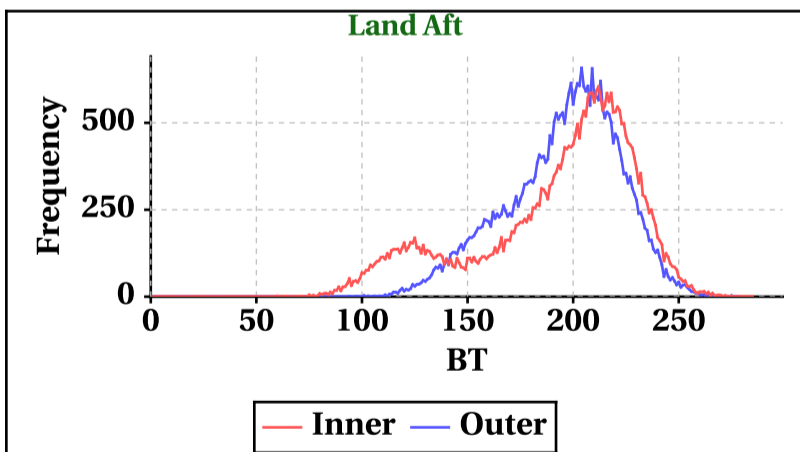
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-40	-42	-58	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	285	300	241	230

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	278	282	241	234

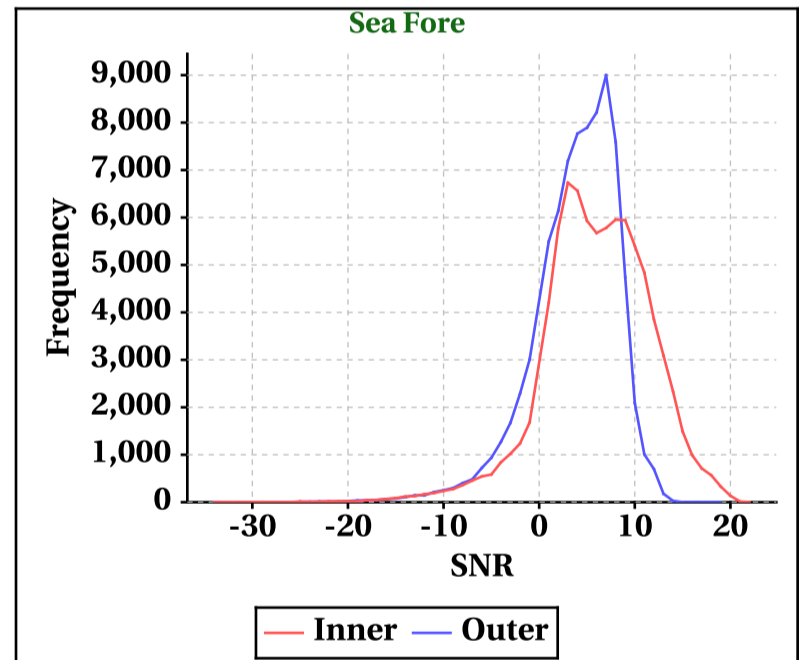
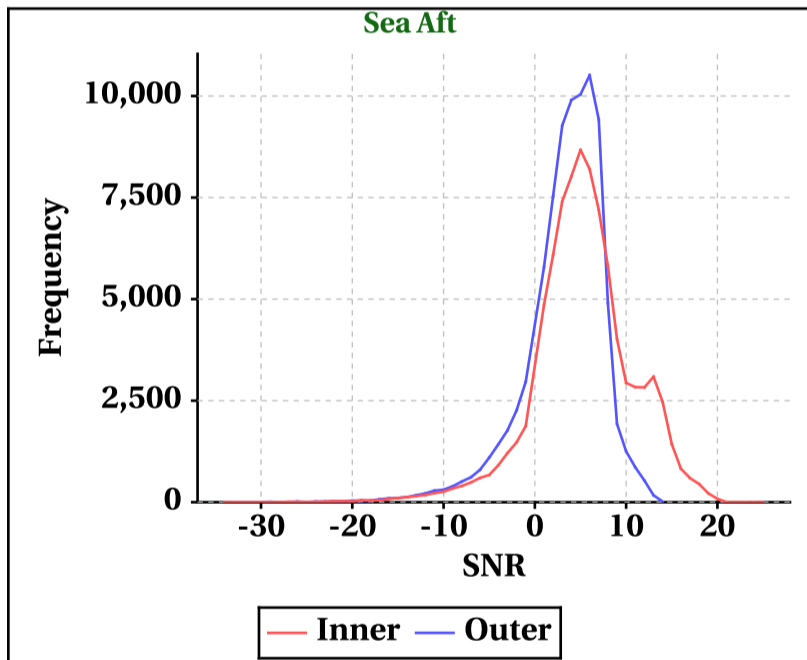
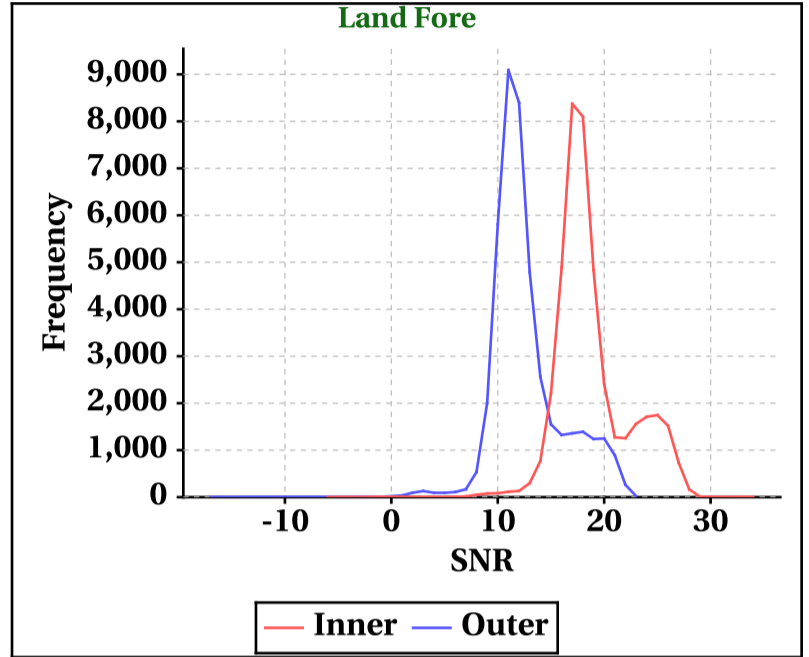
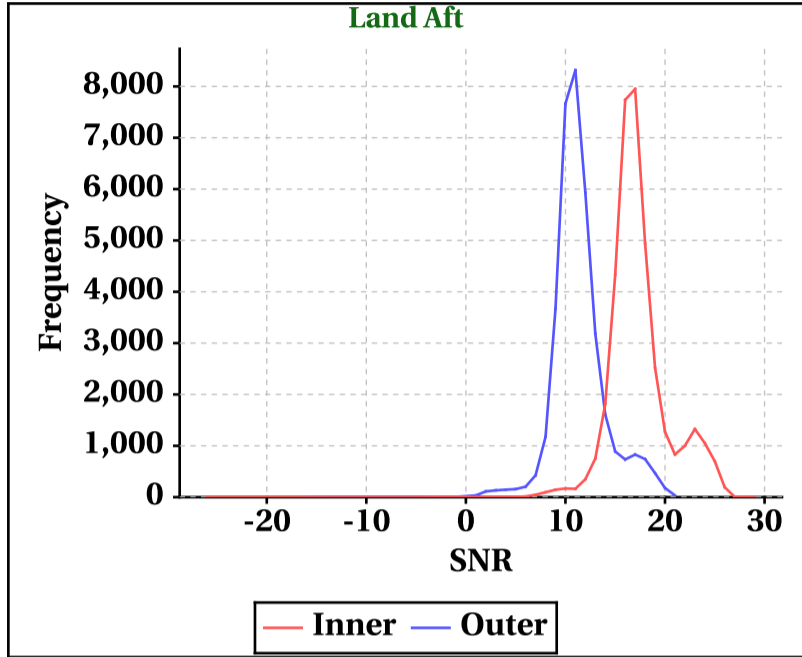


# Dynamic Range (Data Histograms)

## SNR(dBm)

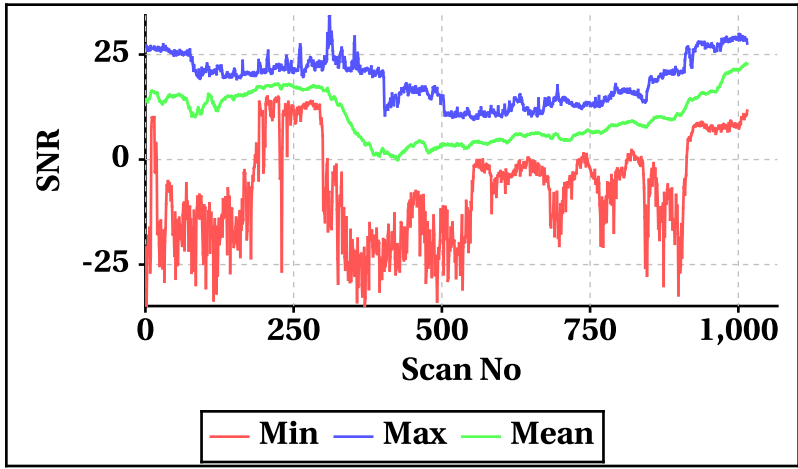
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-26	-6	-34	-34
Max	29	34	25	22

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-16	-17	-33	-34
Max	21	23	14	19

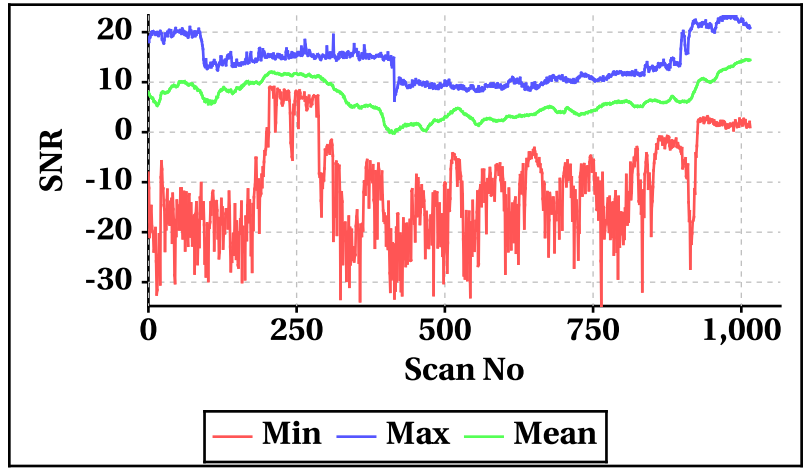


## Orbit-wise behaviour of SNR

Inner Beam (HH)

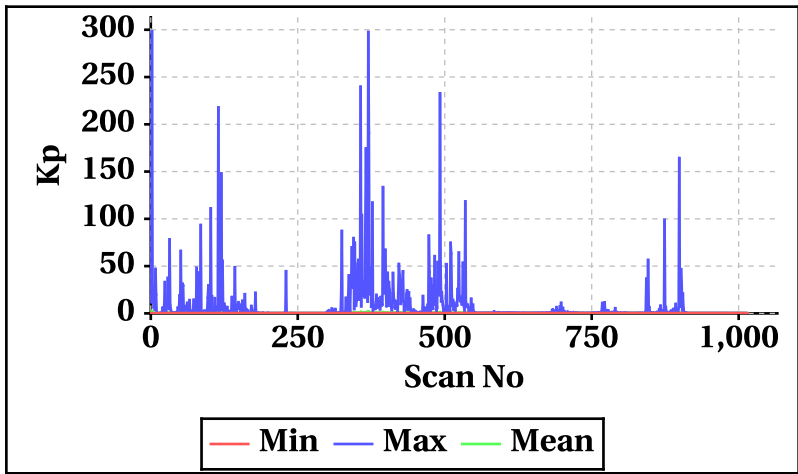


Outer Beam(VV)

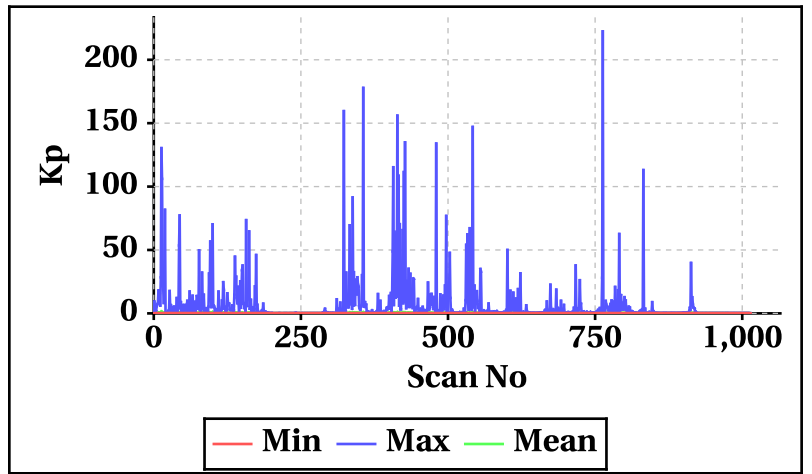


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

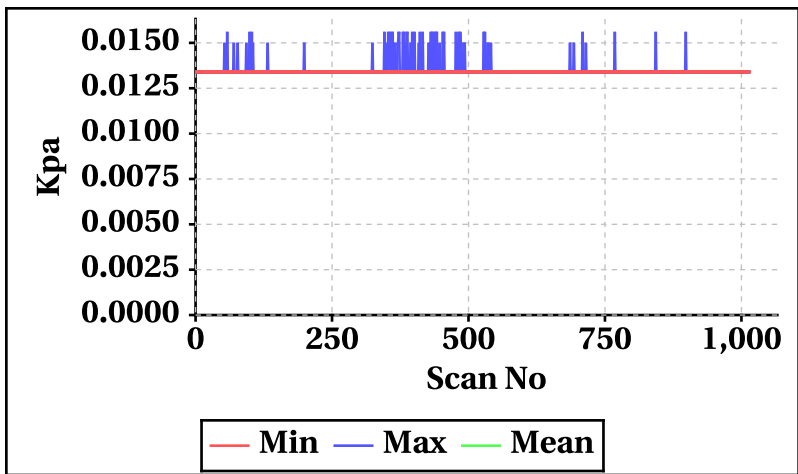
Inner Beam(HH)



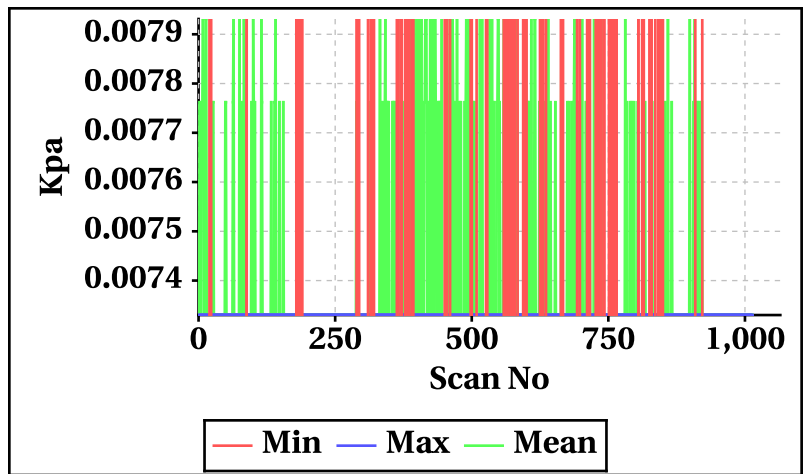
Outer Beam(VV)



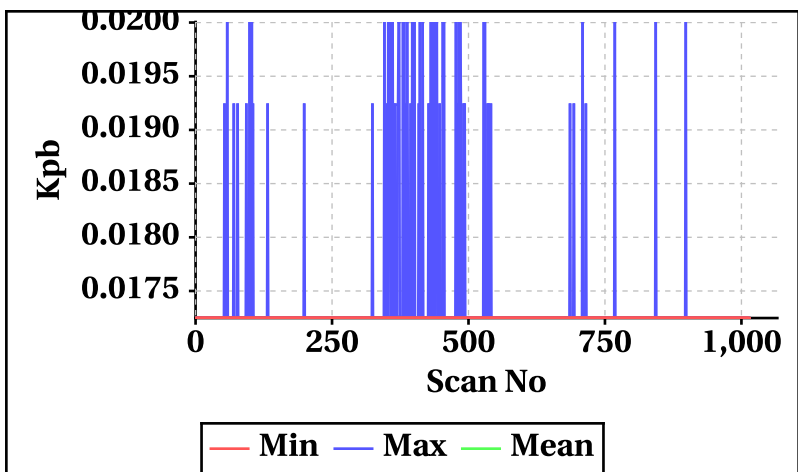
Inner Beam(HH)



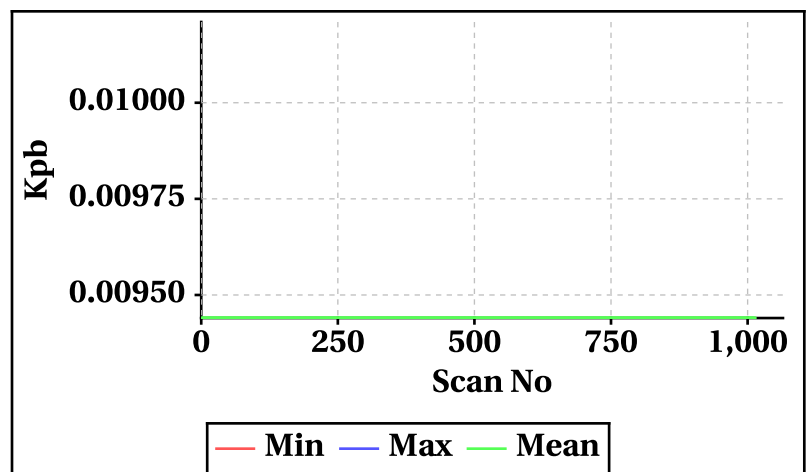
Outer Beam(VV)



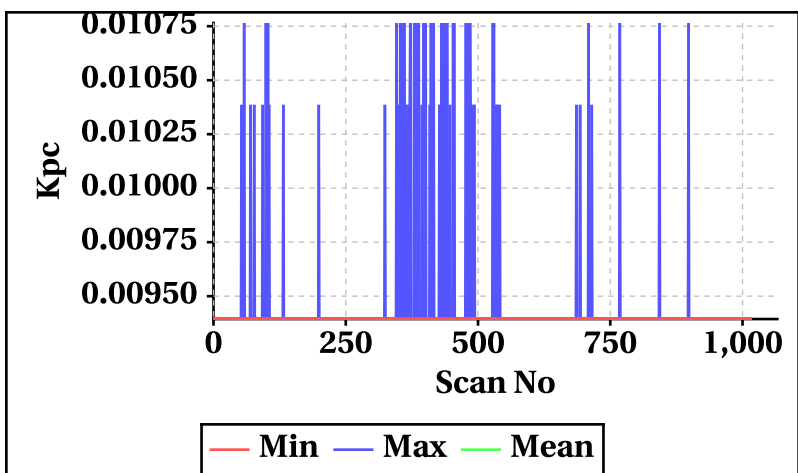
Inner Beam(HH)



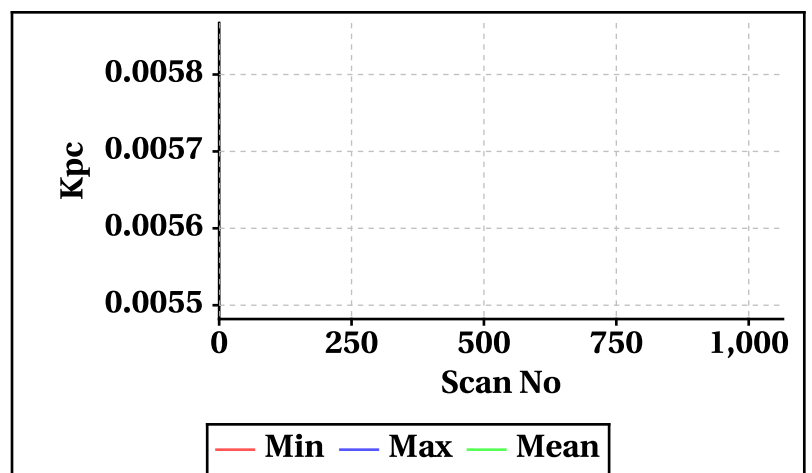
Outer Beam(VV)



Inner Beam(HH)



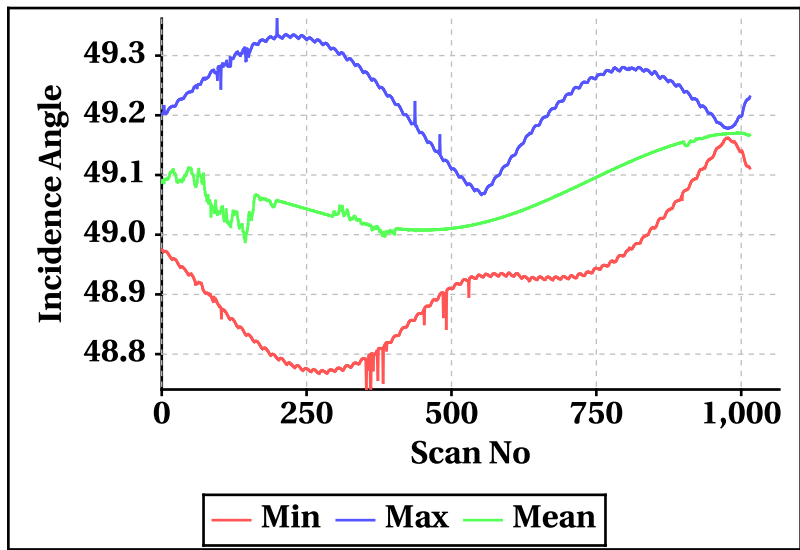
Outer Beam(VV)



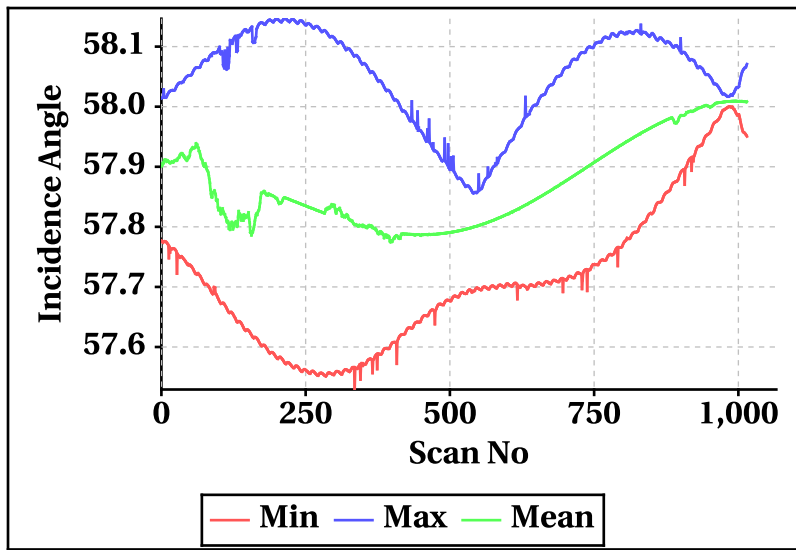


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

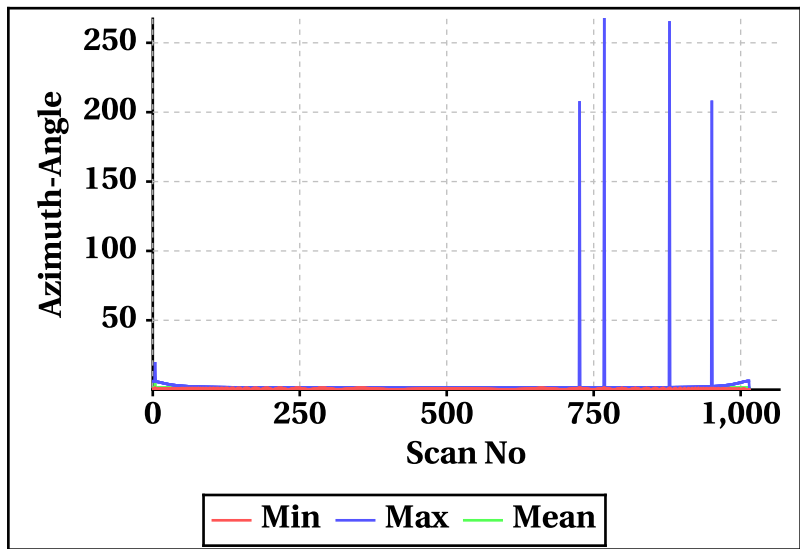
Inner Beam (HH)



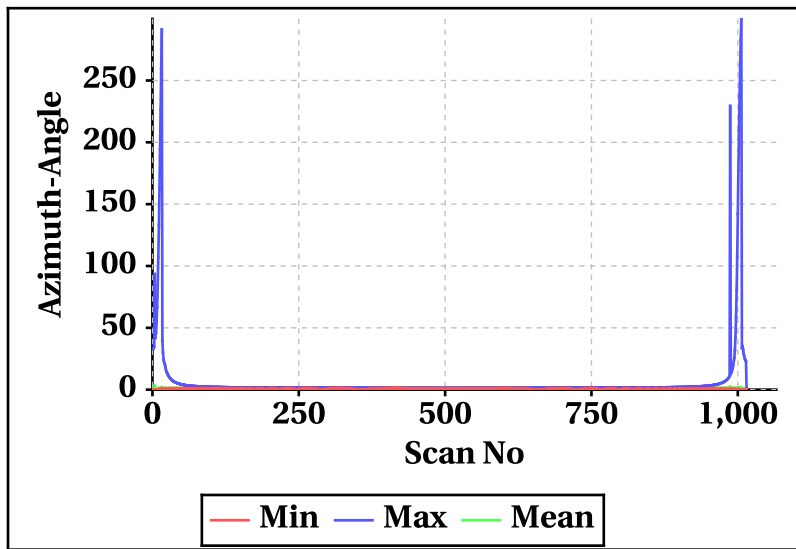
Outer Beam(VV)



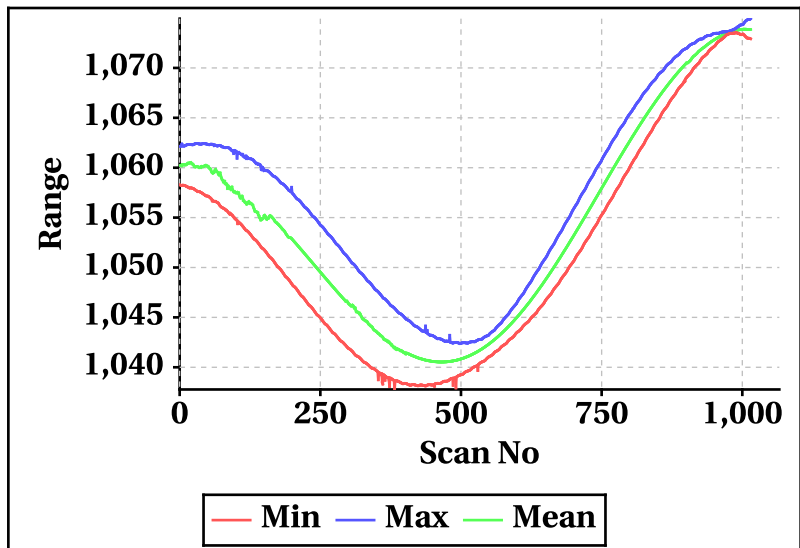
Inner Beam (HH)



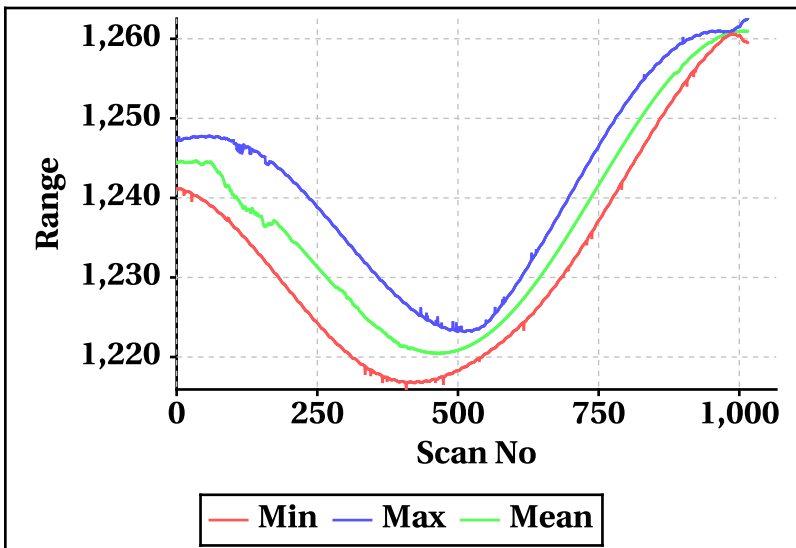
Outer Beam(VV)



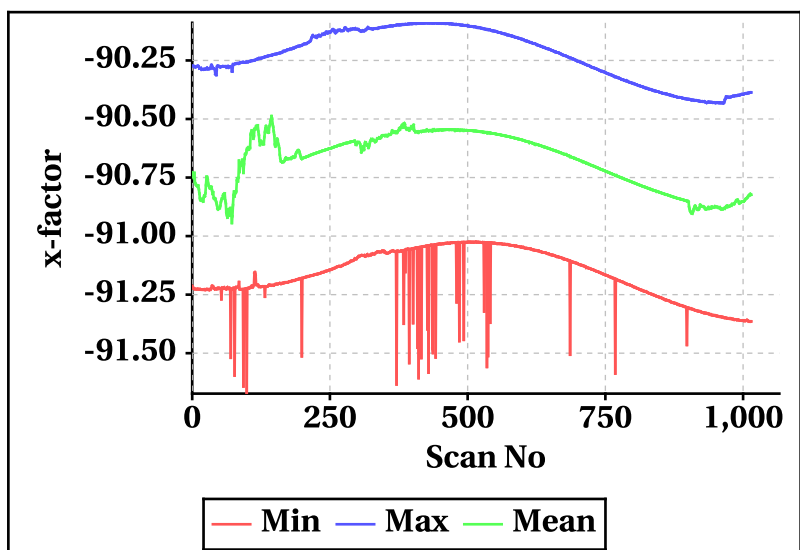
Inner Beam (HH)



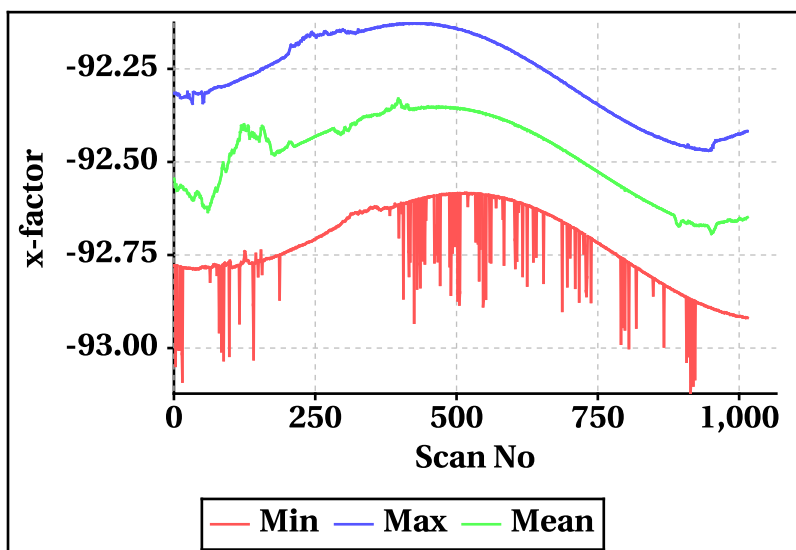
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

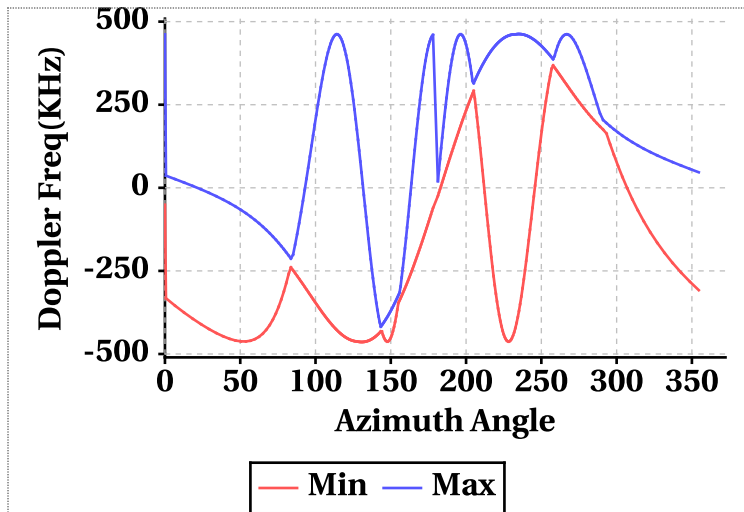


# Doppler Frequency Variation

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

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-463.88	-519.72
<b>Max</b>	462.60	518.56

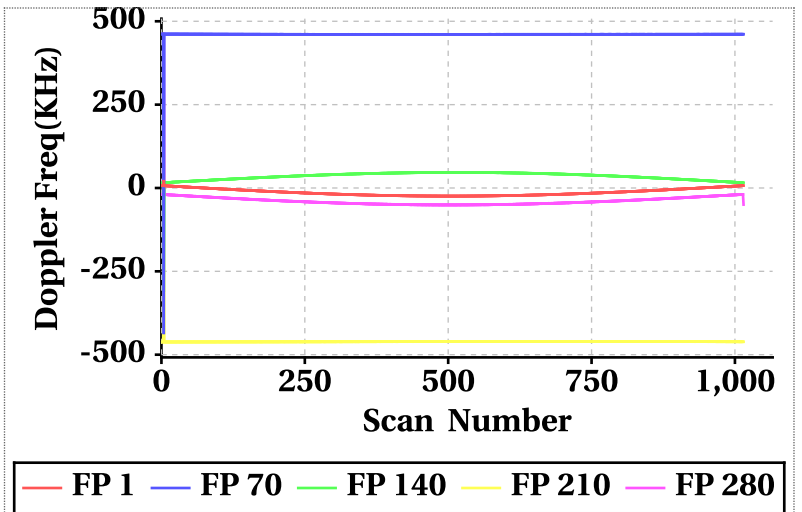
**Footprint wise Doppler frequency variation Inner Beam (HH)**



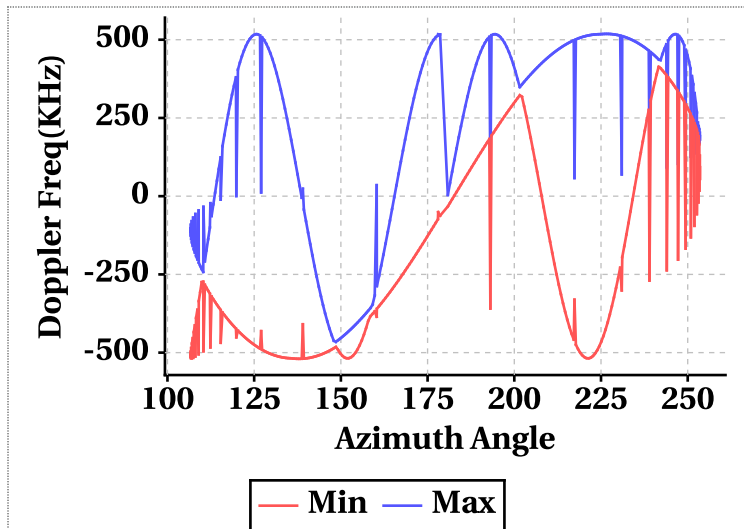
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-24.36	20.06	-12.83	-32.80	3.86	-19.92
Doppler_70	-434.46	461.62	460.07	-492.92	517.30	515.34
Doppler_140	-308.00	46.68	34.99	-358.98	46.60	33.47
Doppler_210	-461.88	206.38	-460.27	-517.80	214.30	-516.24
Doppler_280	-50.86	461.66	-38.79	-61.36	517.38	-37.52

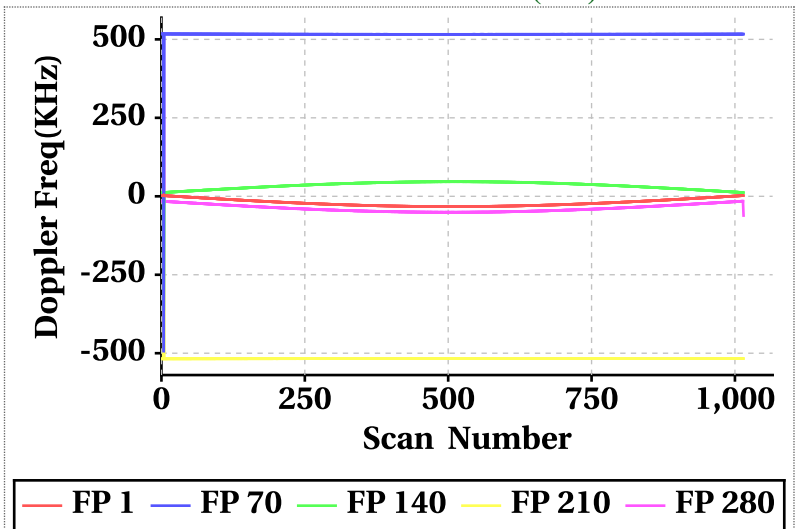
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

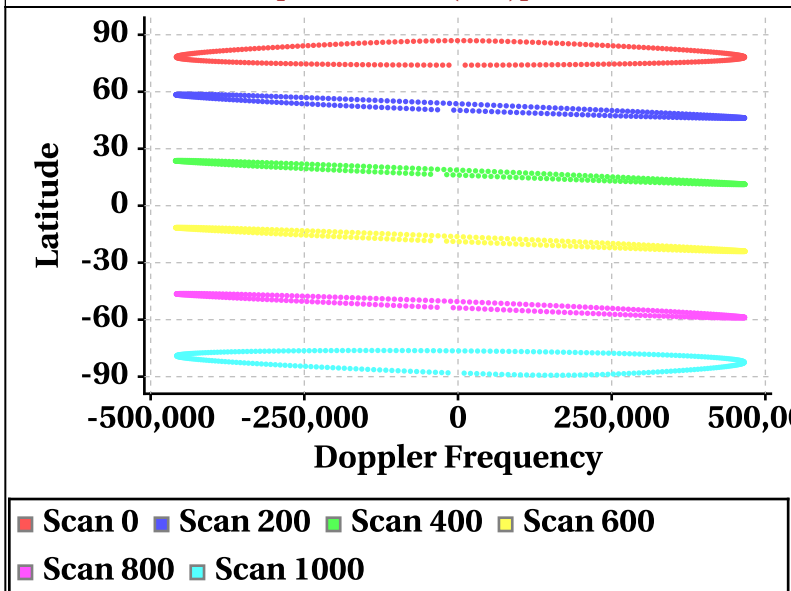


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

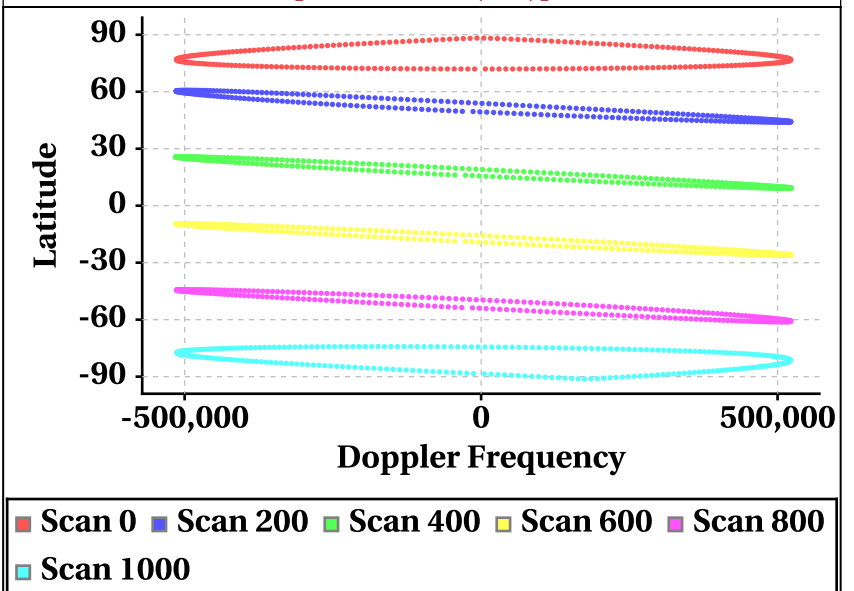


# Latitude Vs Doppler Frequency

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



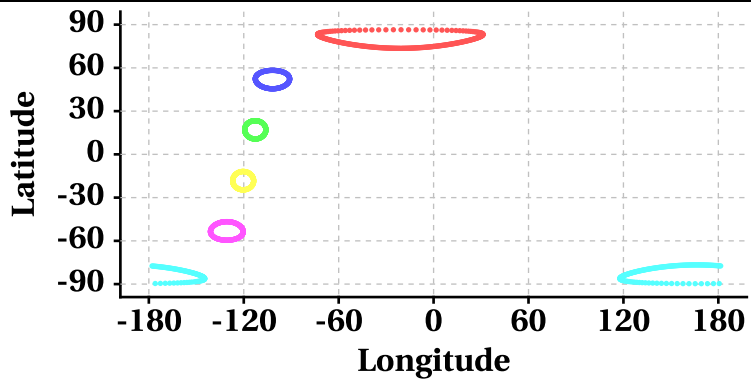
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

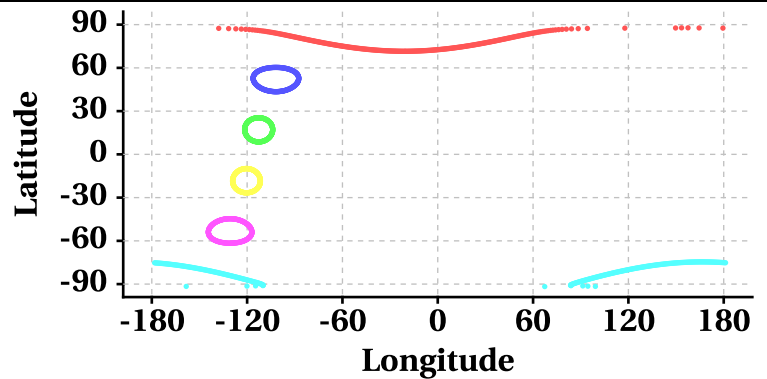
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

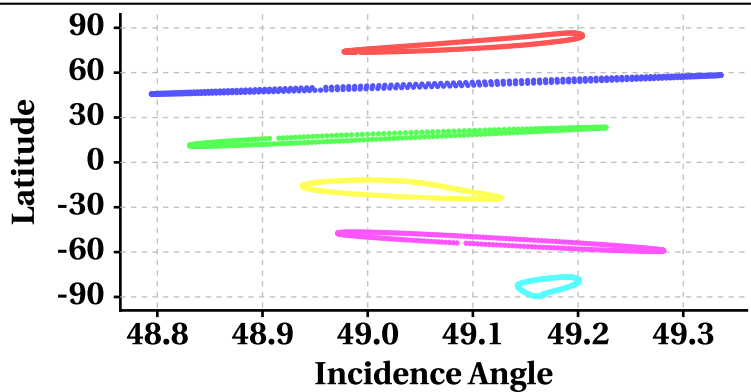
Scan Trace [Outer Beam (VV)]



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

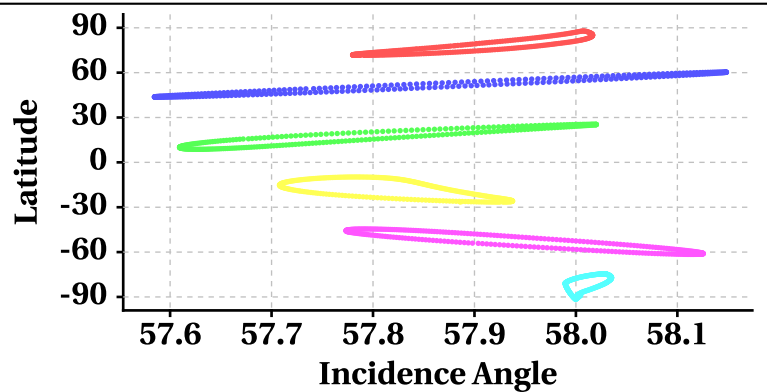
## Latitude Vs Incidence Angle

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



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

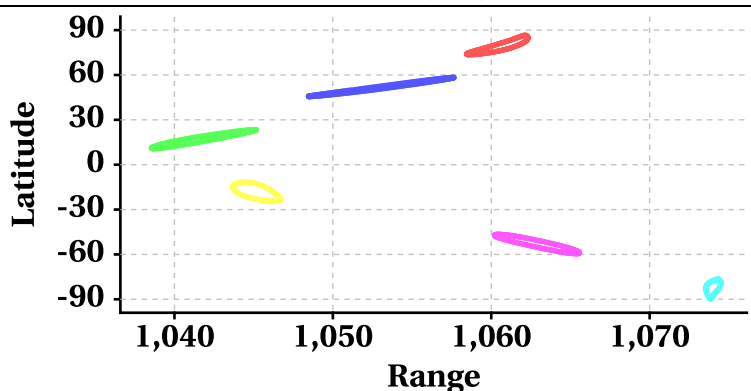
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

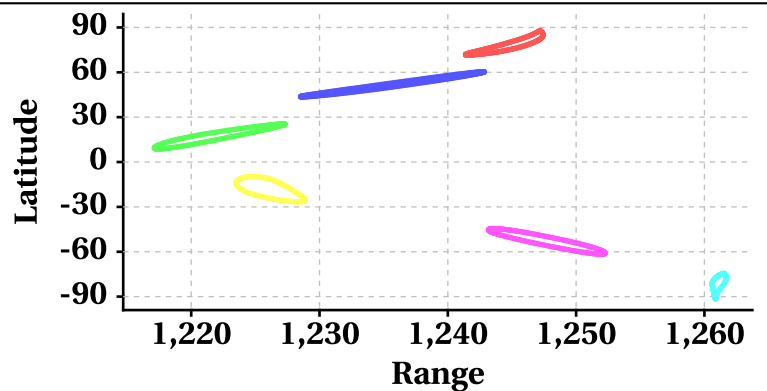
## Latitude Vs Range

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

