

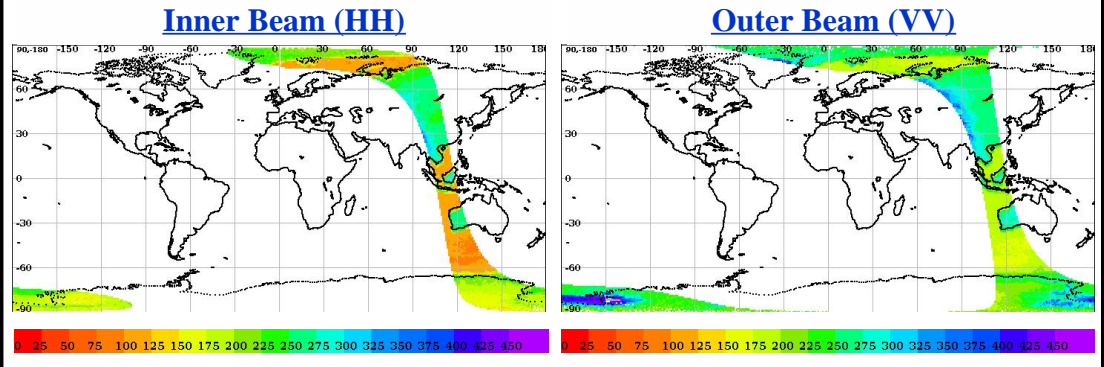
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

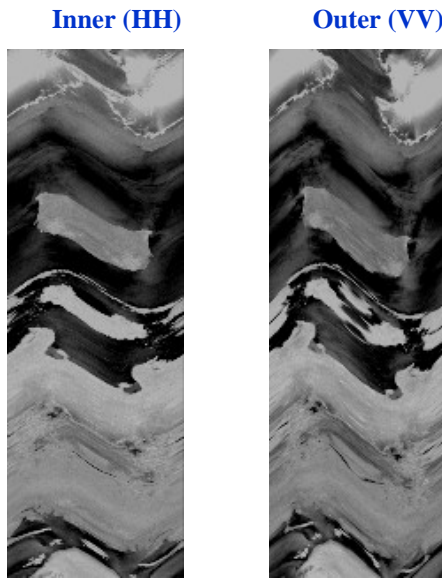
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along 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>	10792	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	10793	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	10792_10793	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	10-10-2018	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	10-10-2018	<b>Equator Crossing Time</b>	13:16:38.000	<b>No Of Outer Slices</b>	15

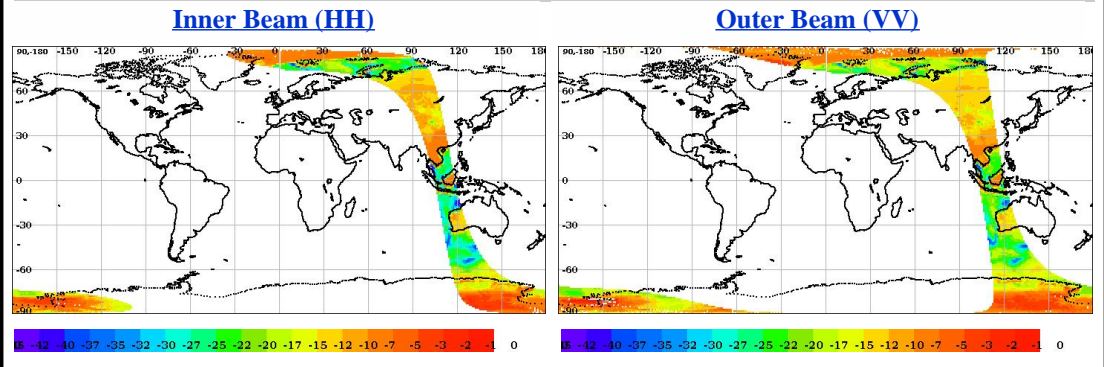
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



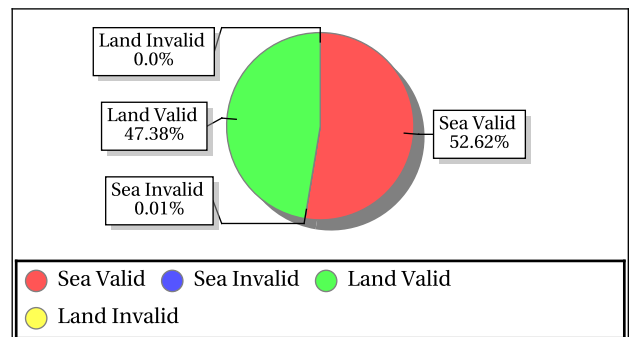
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.01	1.31
Data Not Available From Payload (%)	100.0	0.452834
Slice not within sample array limits (%)	0.00	99.55
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.23	13.48
Noise samples for blending Saturated	0.003149	1.180663
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 (%)	0.022742	0.053643

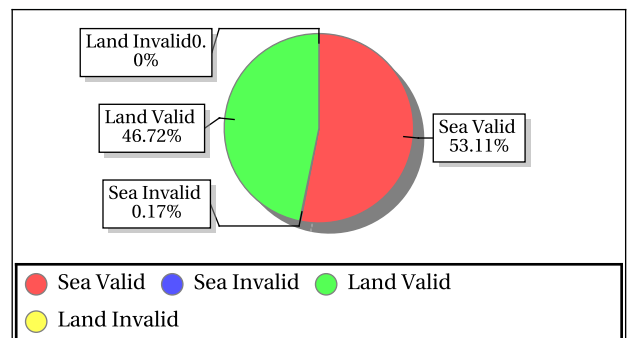
\*DP Format Document

## 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	-9.33	-5.48	-7.45	0.94	145.40	209.48	172.13	12.59
ANT_1	-75.00	121.00	Inner	ASC	Fore	-9.82	-6.00	-7.64	0.92	154.88	206.38	175.16	11.97
Australia	-23.00	118.00	Inner	ASC	Aft	-13.53	-8.45	-9.84	0.92	237.29	295.03	263.60	15.95
Australia	-23.00	118.00	Inner	ASC	Fore	-11.95	-8.37	-9.61	0.81	247.46	297.15	272.62	13.66
ANT_1	-75.00	121.00	Outer	ASC	Aft	-10.33	-7.52	-8.49	0.83	203.88	239.57	222.73	10.12
ANT_1	-75.00	121.00	Outer	ASC	Fore	-9.96	-6.85	-8.41	0.92	175.80	217.30	197.54	12.04
Australia	-23.00	118.00	Outer	ASC	Aft	-13.21	-10.38	-11.59	0.67	234.28	313.21	276.20	20.85
Australia	-23.00	118.00	Outer	ASC	Fore	-12.35	-9.76	-11.23	0.60	236.08	312.17	279.77	16.23



## 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	258.57	0.31	2.530	0.12	242.11	0.27	2.071	0.12	1.06	0.12	0.001	0.12	5.06	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	0.01	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>	-34.26	24.83	4.80	0.245	-33.97	25.18	6.40	2.316	-10.00	29.44	18.77	16.180	-17.10	30.11	19.31	20.944

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	223.15	0.28	2.781	0.09	205.28	0.27	2.368	0.09	1.59	0.09	0.001	0.09	2.50	0.09	0.006
<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	0.02	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	18.19	2.62	0.000	-34.43	18.42	3.94	0.000	-13.15	23.16	12.85	0.072	-15.17	23.58	13.16	0.501

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)

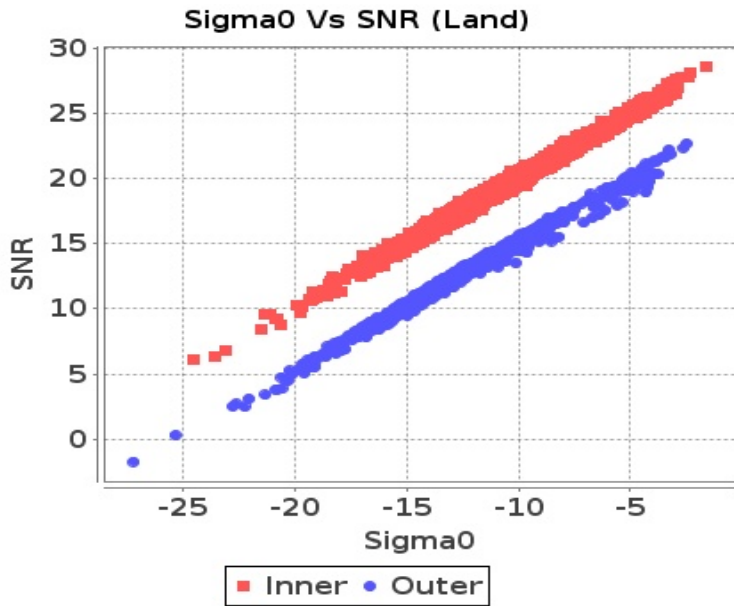
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.73	49.54	49.10	0.000	57.46	58.40	58.02	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	215.52	1.27	2.610	0.0000	296.38	1.27	3.733	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1028.98	1100.46	1055.62	9.801	1204.79	1294.18	1239.56	28.656	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.74	-89.83	-90.44	0.000	-94.84	-91.88	-92.27	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.15	15.73	15.43	0.000	18.94	30.22	20.41	6.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.90	20.65	19.73	0.000	18.66	20.57	19.64	0.000	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

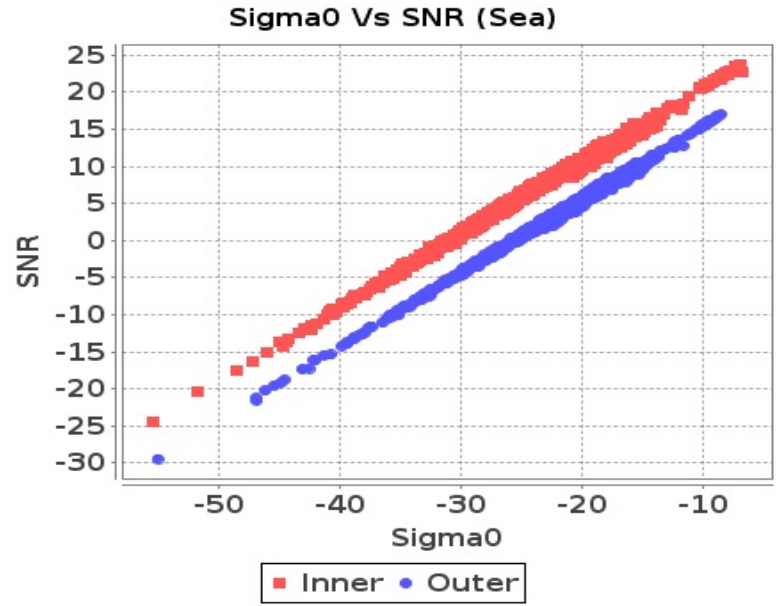


## Sigma0 Behaviour (Sigma0 Vs SNR)

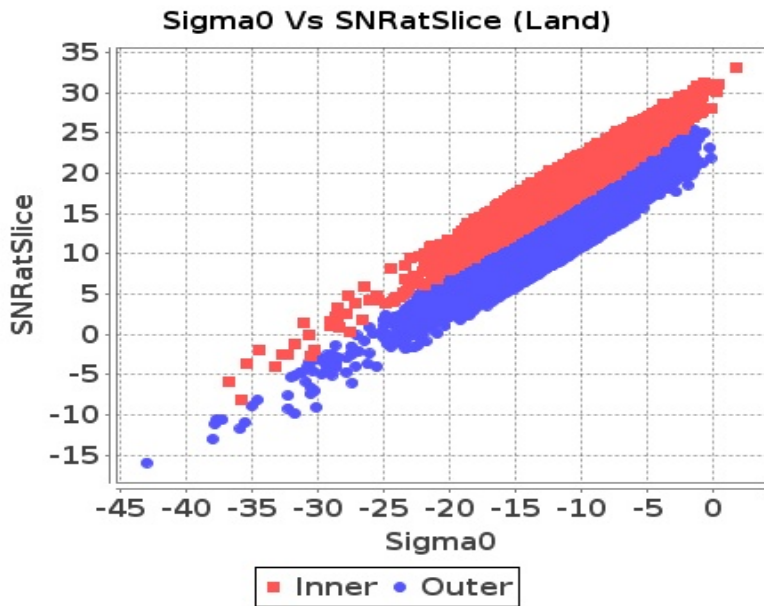
Footprint-Land



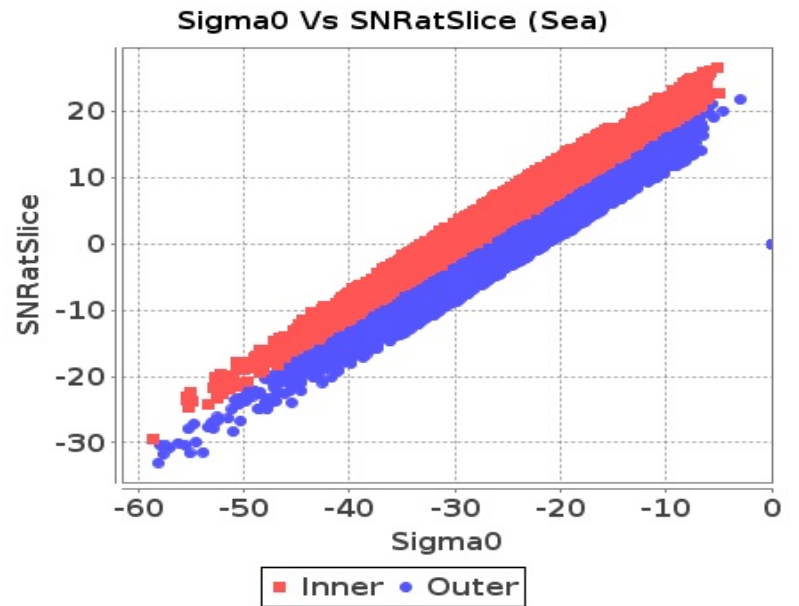
Footprint-Sea



Slice-Land

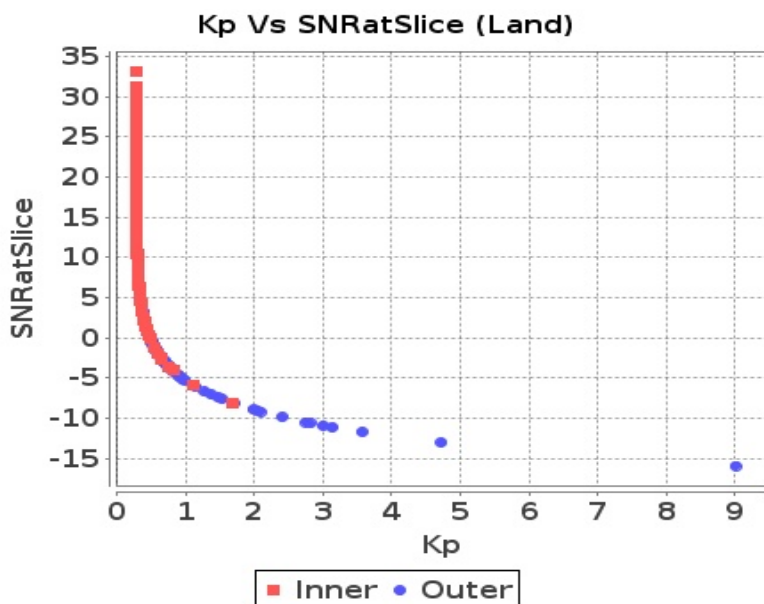


Slice-Sea

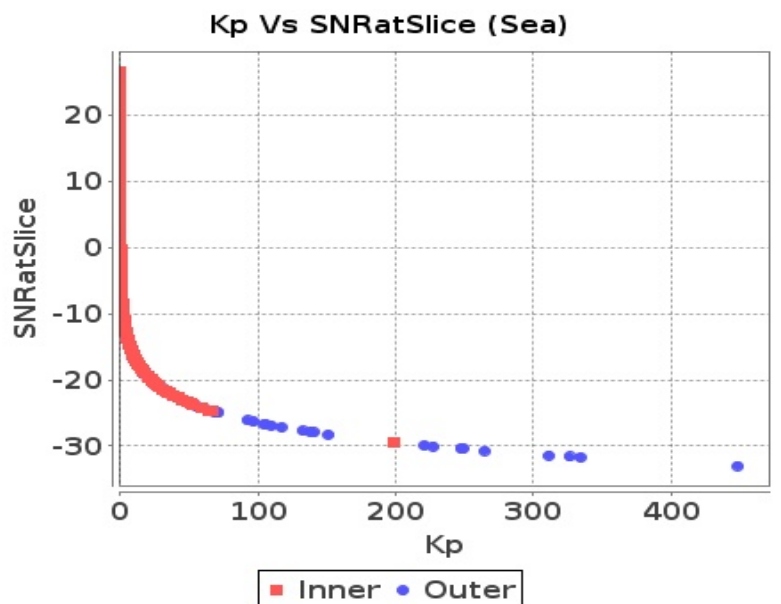


## Sigma0 Behaviour (Kp Vs SNR)

Slice



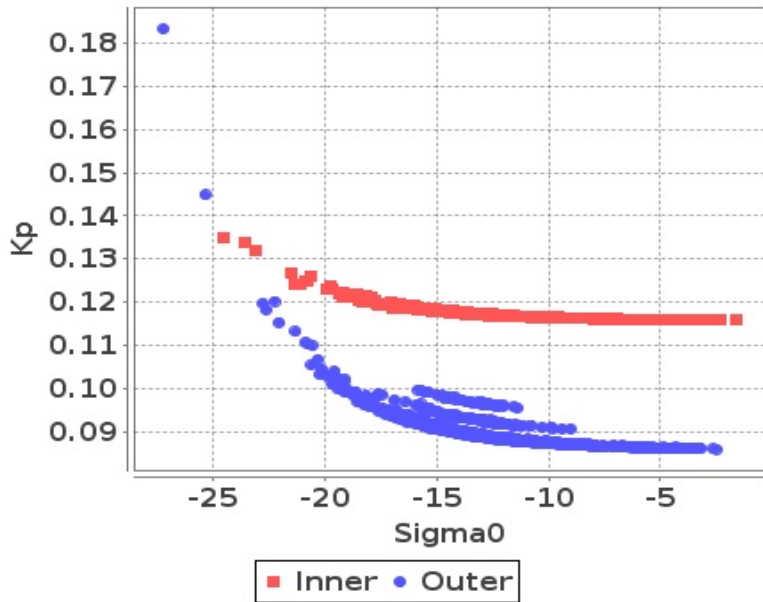
Slice



# Sigma0 Behaviour(Sigma0 Vs Kp)

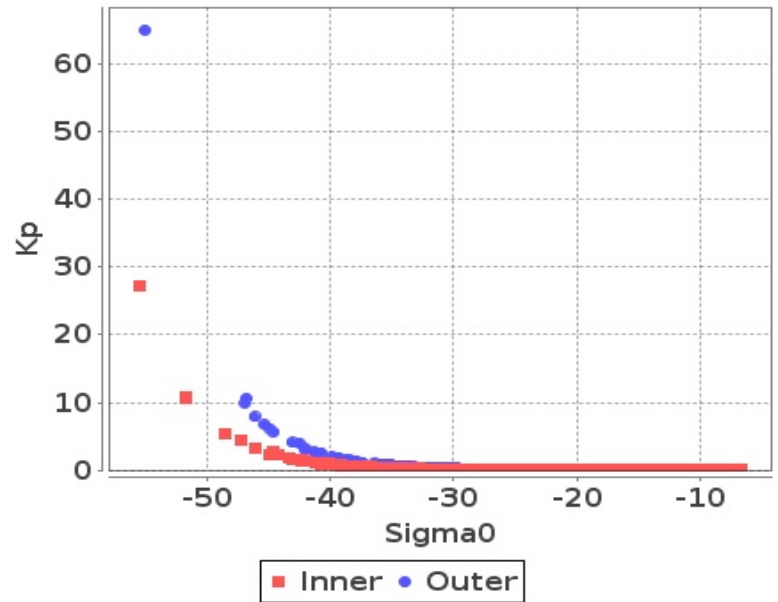
## Footprint-Land

### Sigma0 Vs Kp (Land)



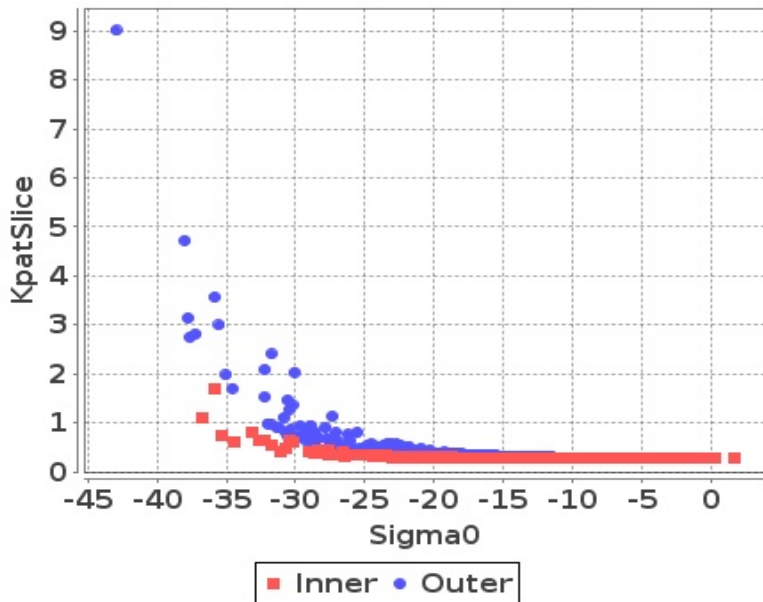
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



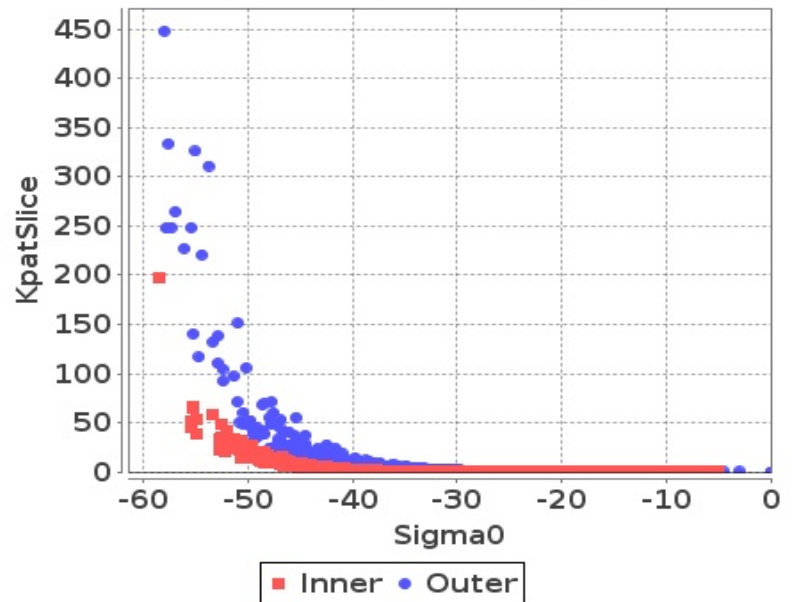
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)



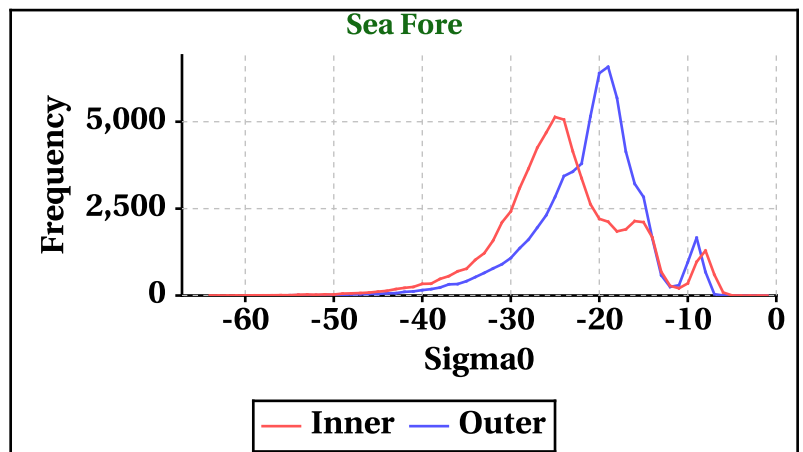
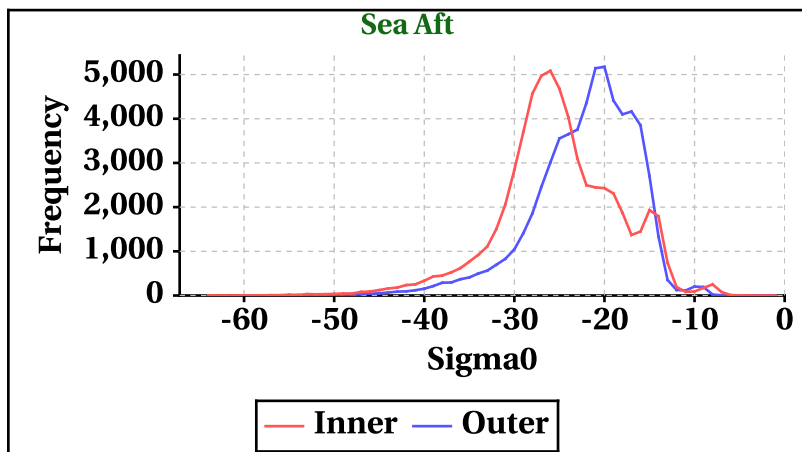
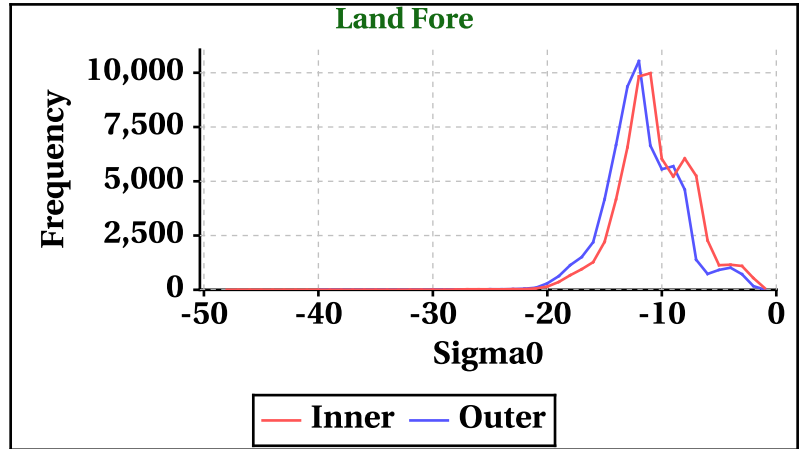
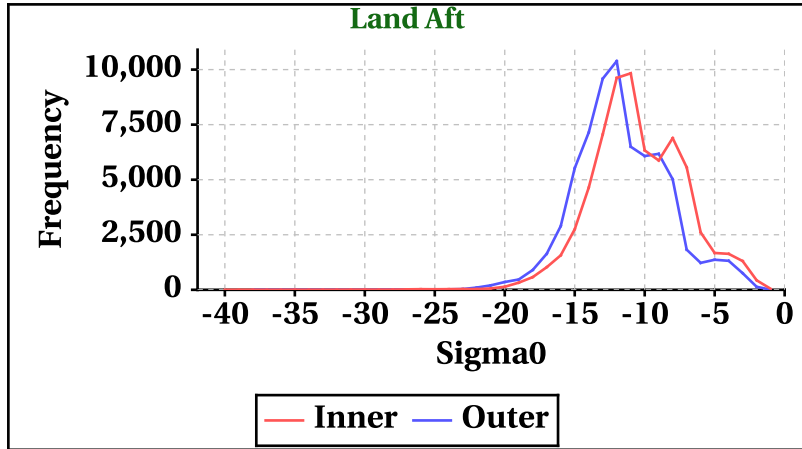


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-40	-48	-64	-64
Max	0	0	0	0

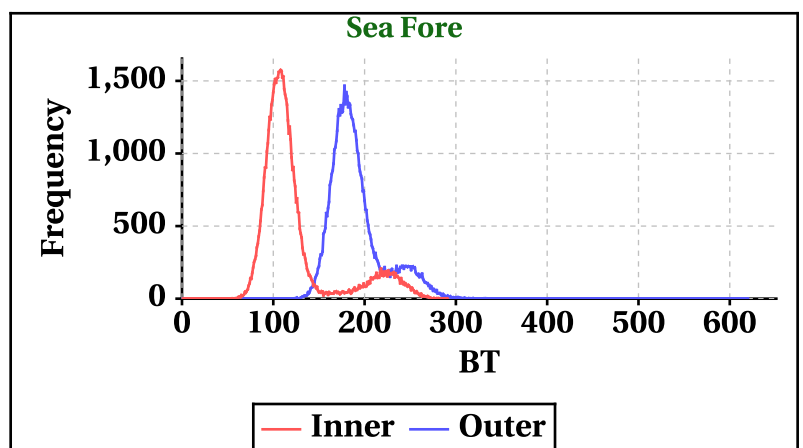
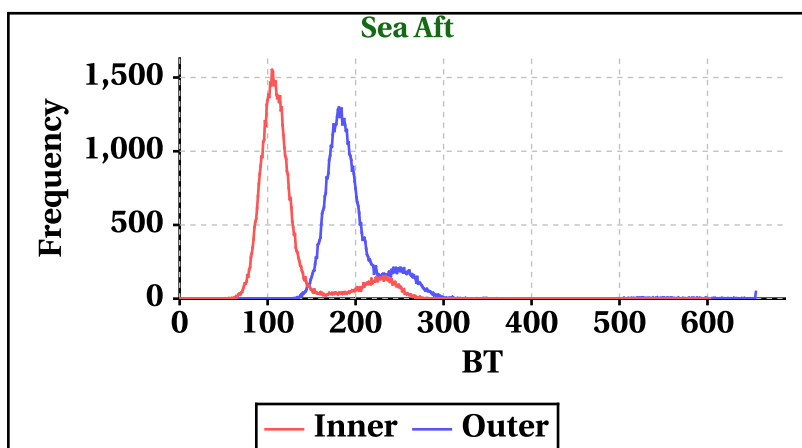
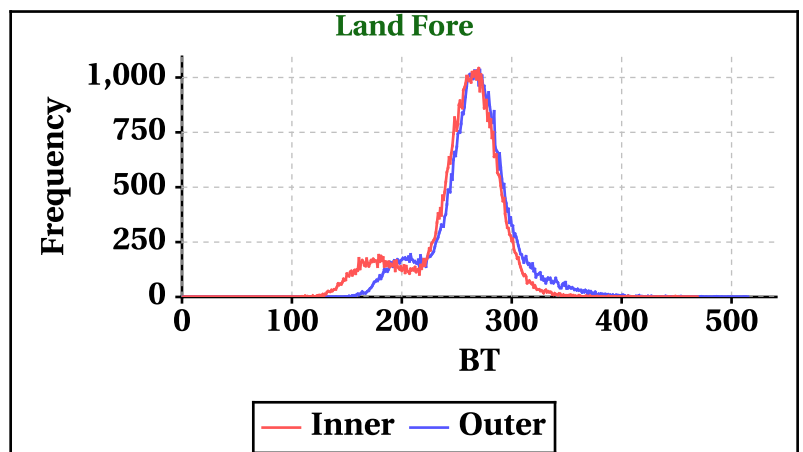
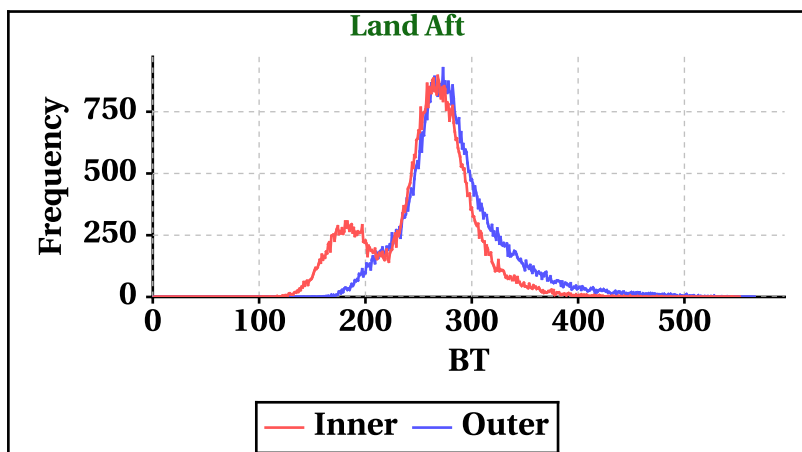
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-38	-40	-60	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	552	469	603	291

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	566	515	655	620

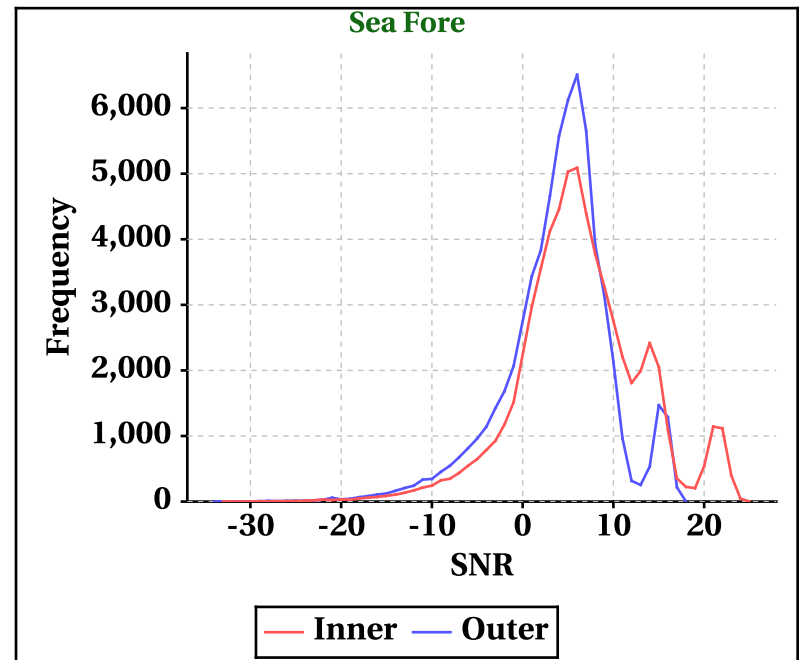
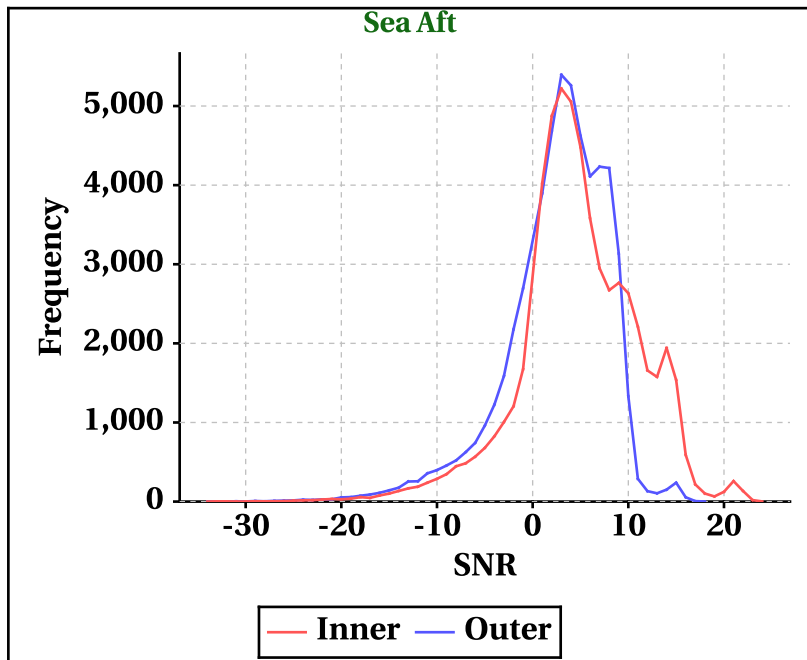
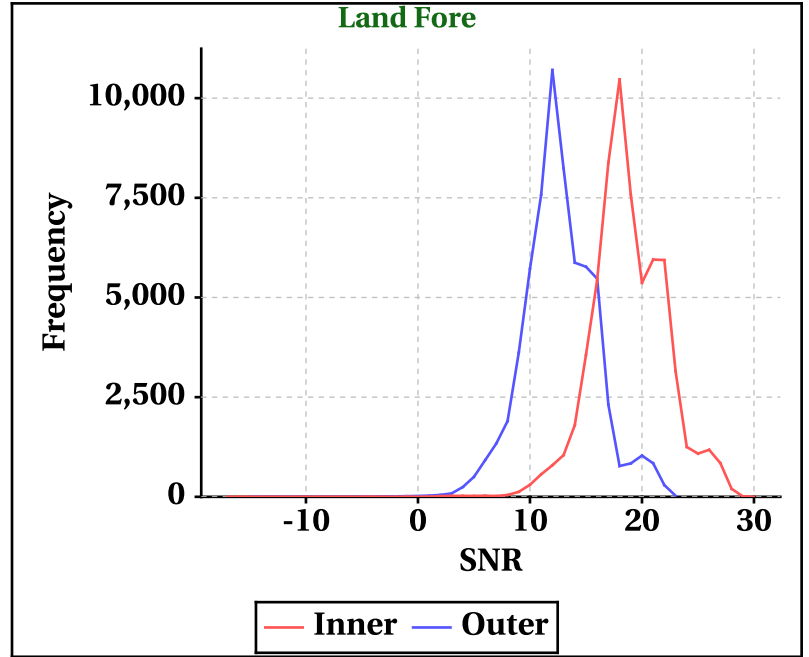
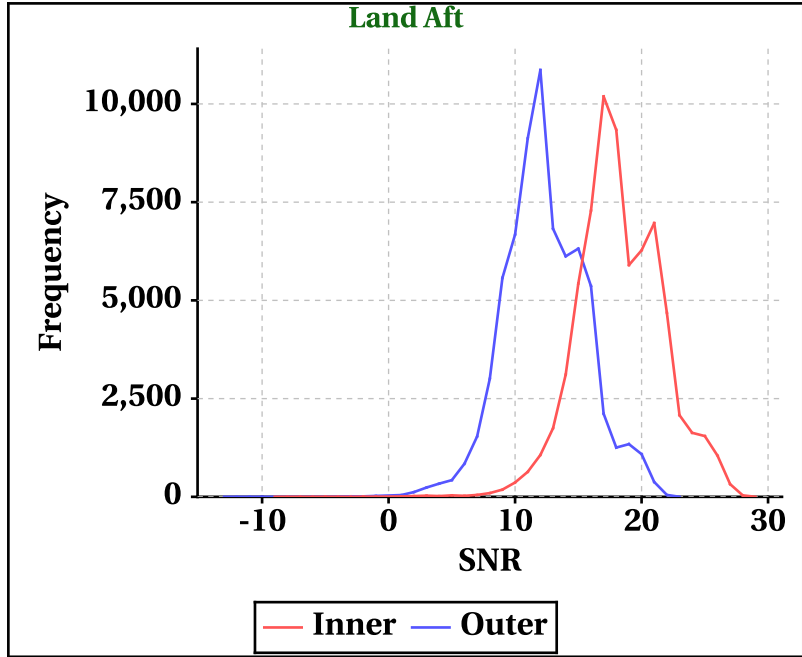


# Dynamic Range (Data Histograms)

## SNR(dBm)

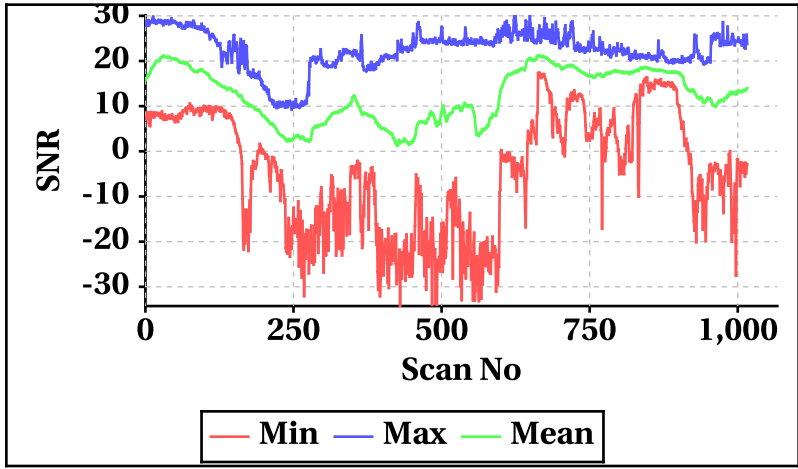
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-9	-17	-34	-33
Max	29	30	24	25

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-13	-15	-34	-34
Max	23	23	18	18

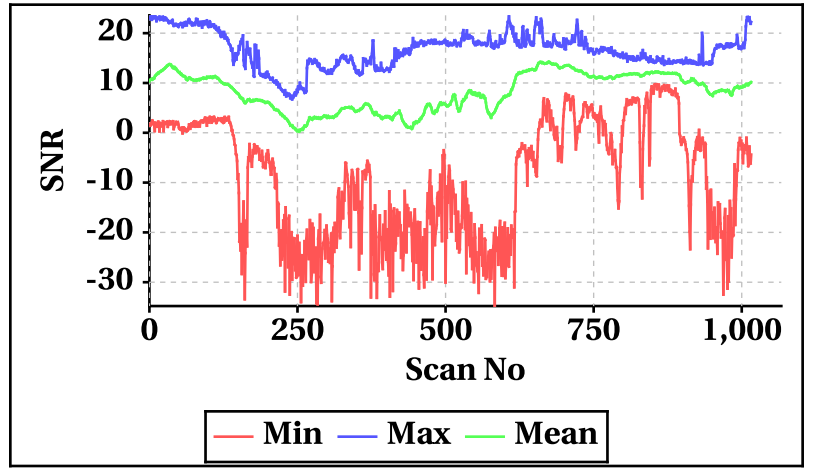


## Orbit-wise behaviour of SNR

Inner Beam (HH)

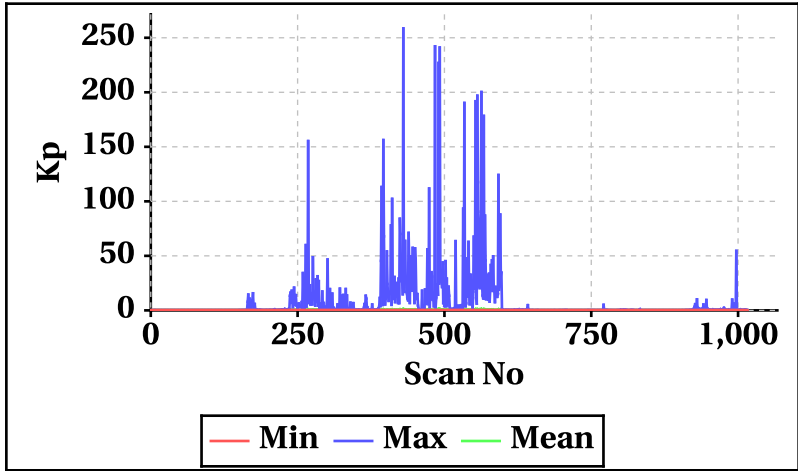


Outer Beam(VV)

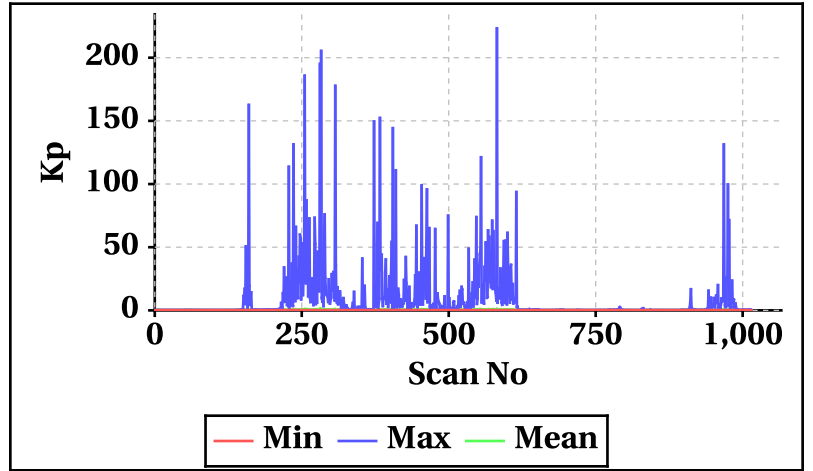


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

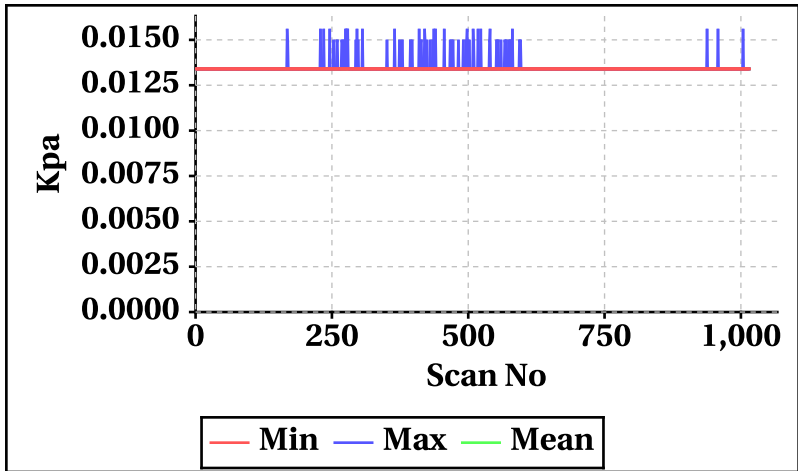
Inner Beam(HH)



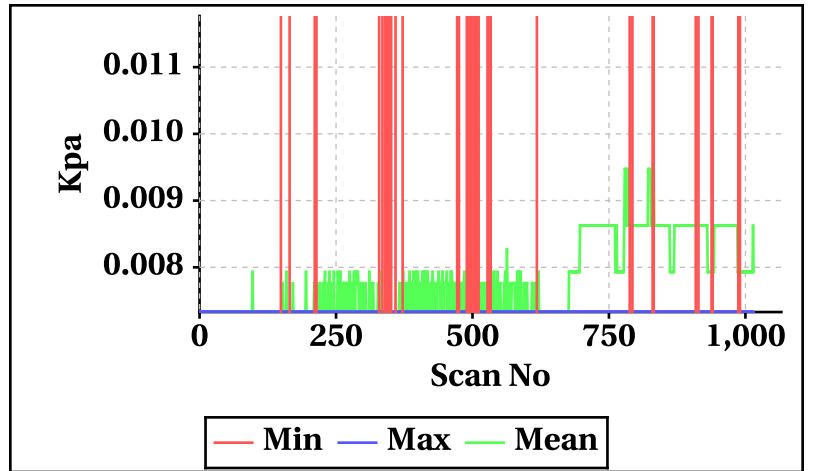
Outer Beam(VV)



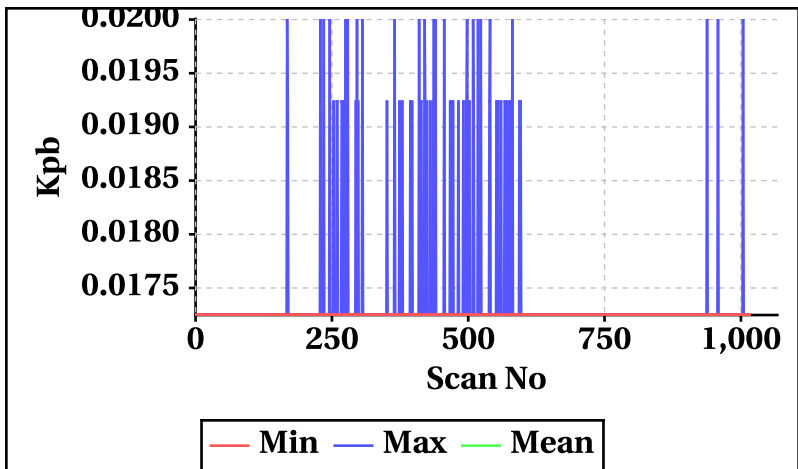
Inner Beam(HH)



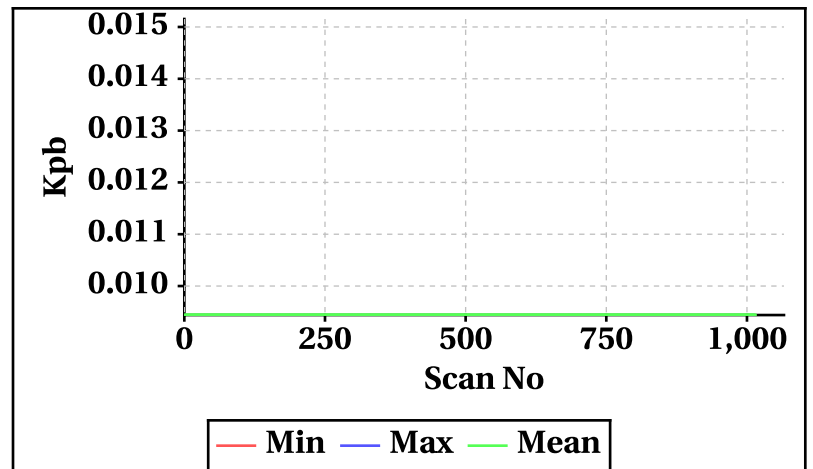
Outer Beam(VV)



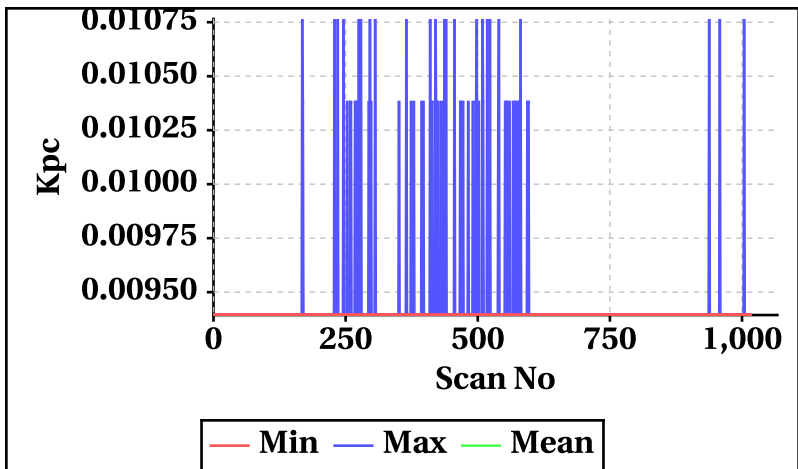
Inner Beam(HH)



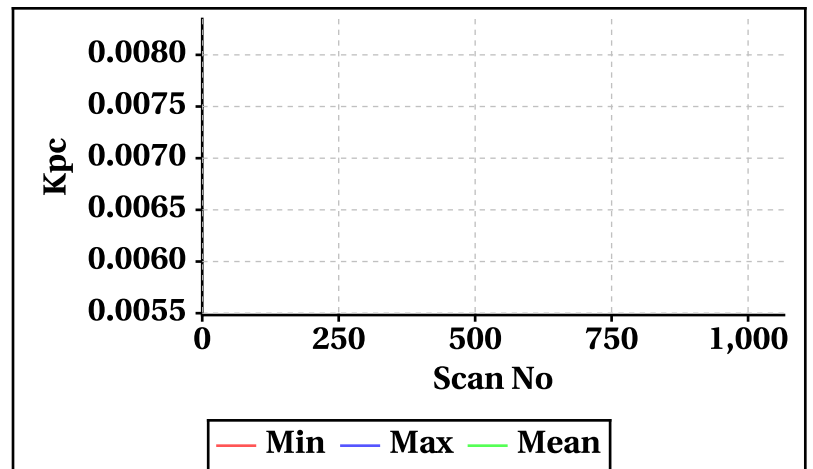
Outer Beam(VV)



Inner Beam(HH)



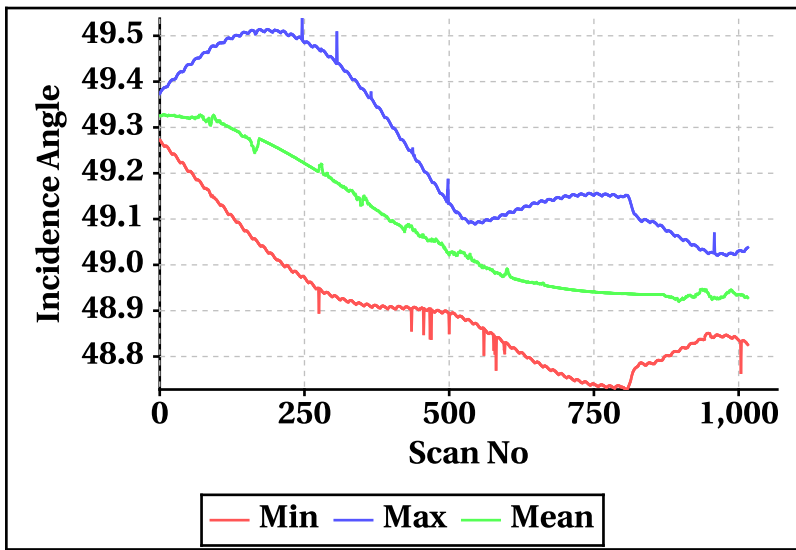
Outer Beam(VV)



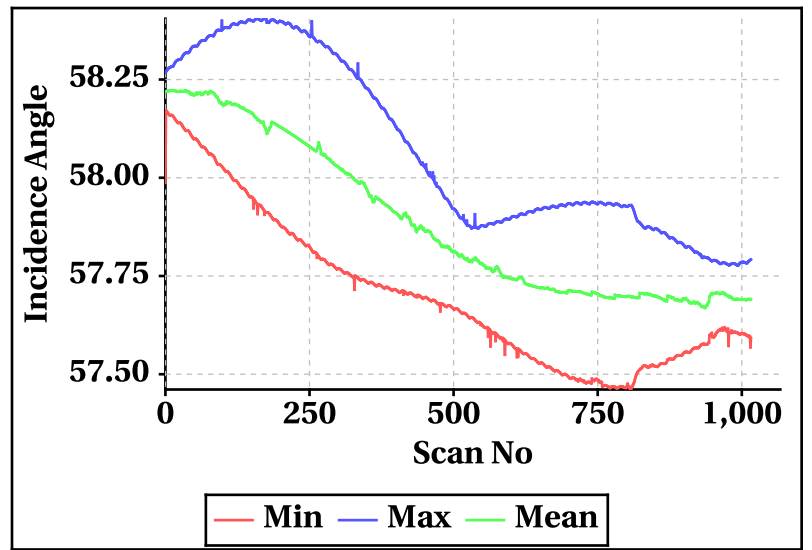


# Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

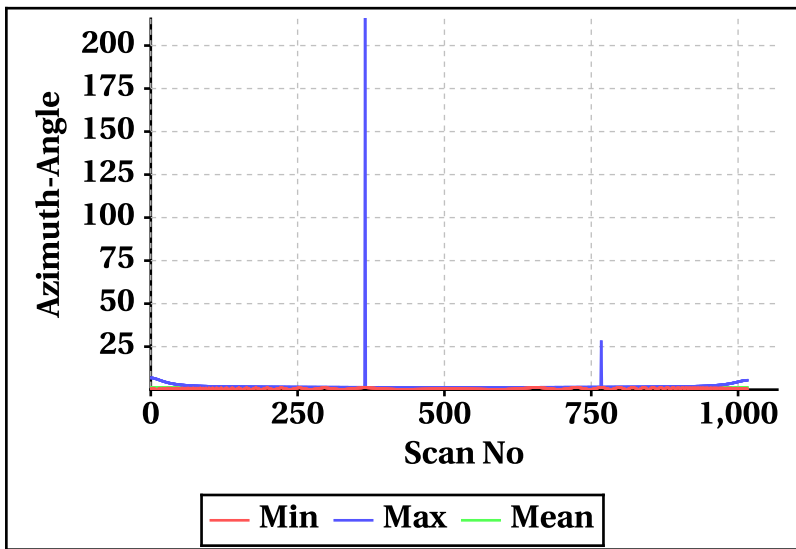
**Inner Beam (HH)**



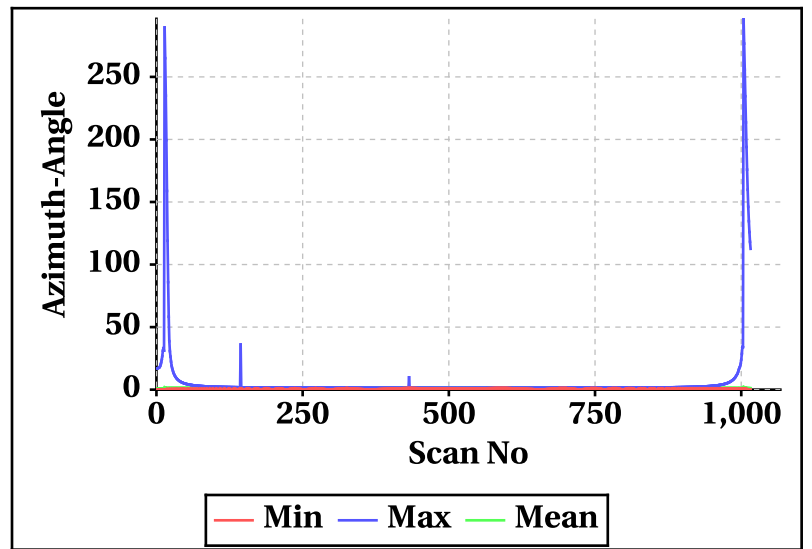
**Outer Beam(VV)**



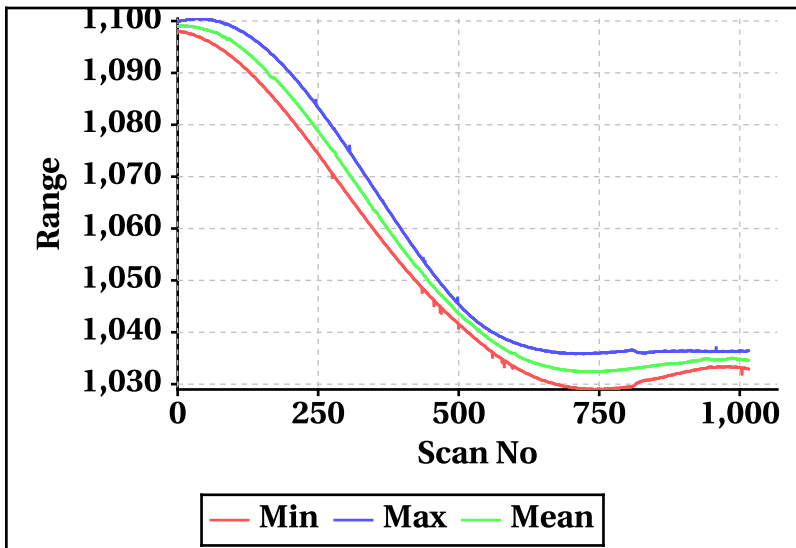
**Inner Beam (HH)**



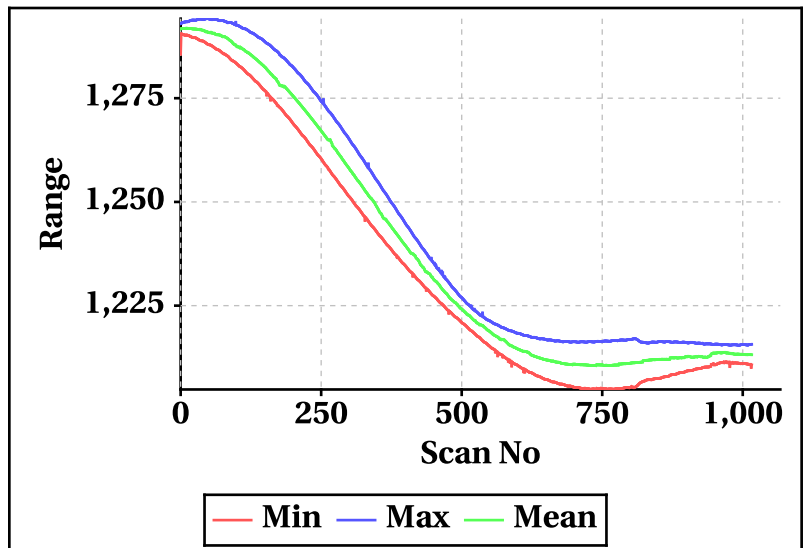
**Outer Beam(VV)**



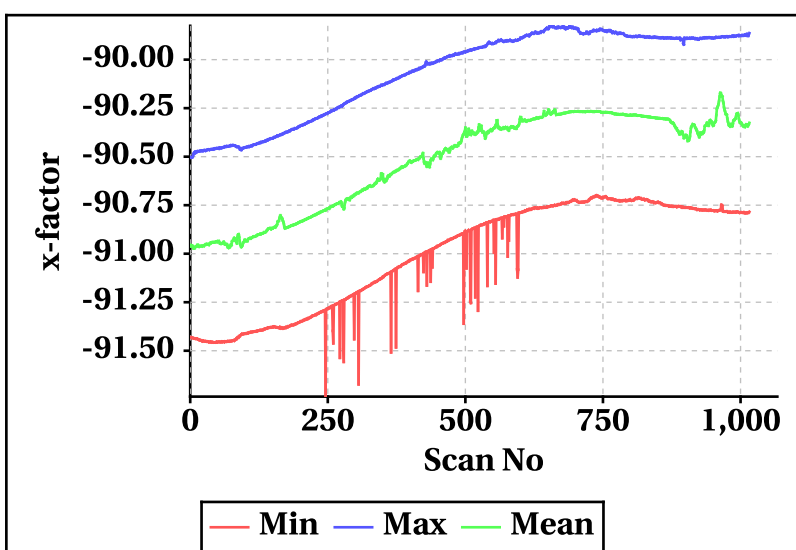
**Inner Beam (HH)**



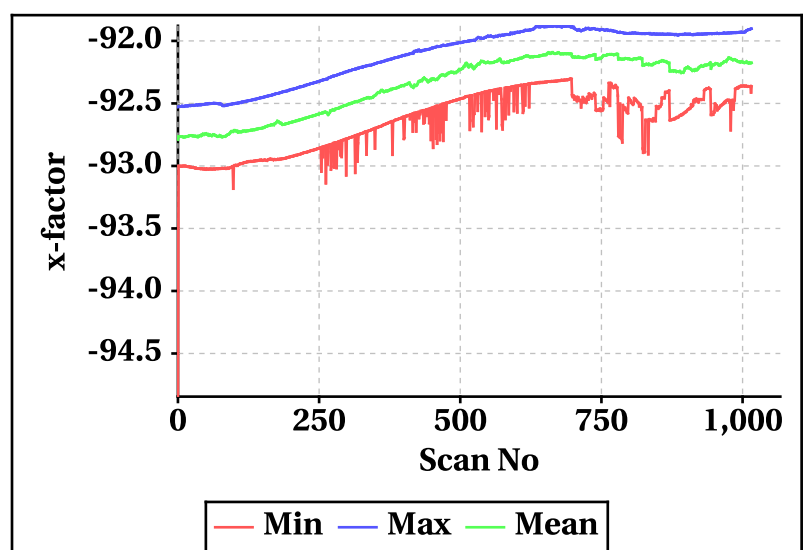
**Outer Beam(VV)**



**Inner Beam (HH)**



**Outer Beam(VV)**

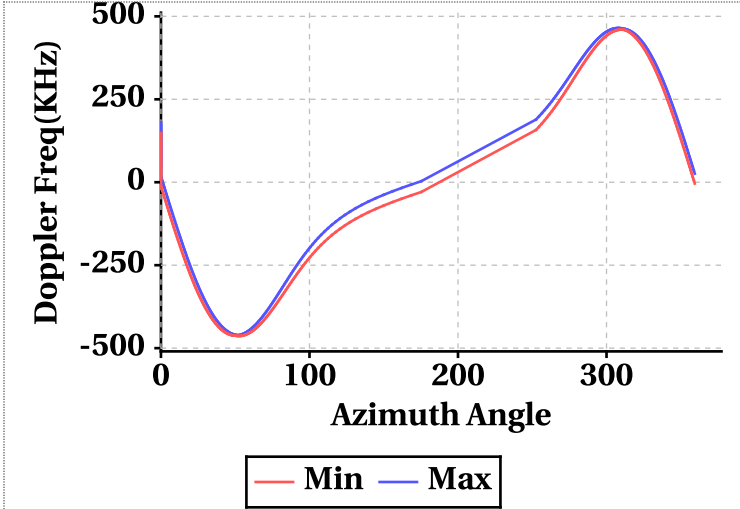


# Doppler Frequency Variation

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

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-463.34	-519.22
<b>Max</b>	464.68	520.46

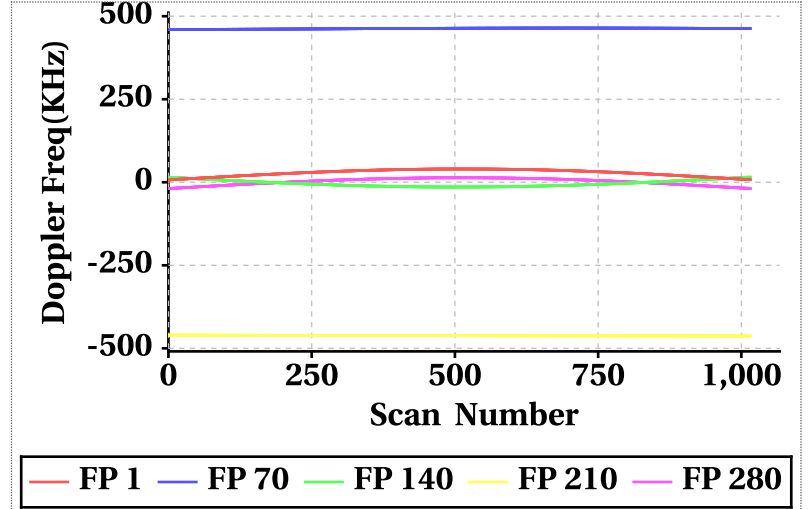
**Footprint wise Doppler frequency variation Inner Beam (HH)**



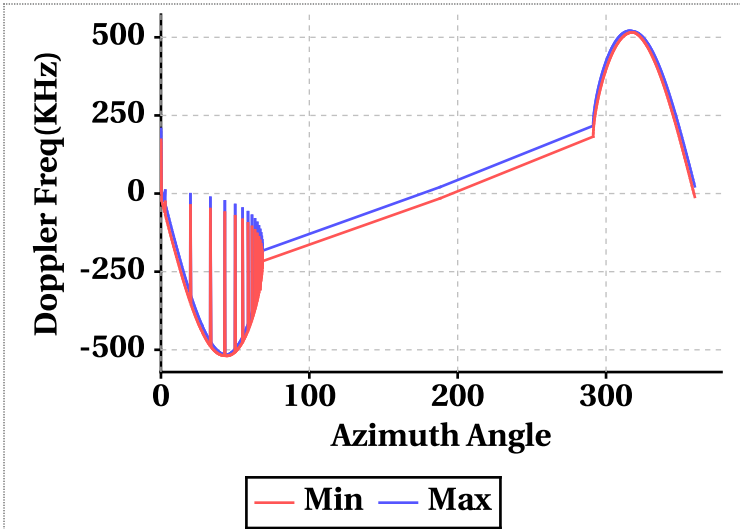
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	0.00	40.02	28.17	-18.96	38.94	25.77
Doppler_70	459.94	464.30	462.83	515.42	520.26	518.66
Doppler_140	-14.32	15.54	-3.50	-22.18	11.58	-9.93
Doppler_210	-462.82	-460.34	-461.74	-518.90	-516.06	-517.63
Doppler_280	-19.02	13.66	1.77	-15.38	20.90	7.71

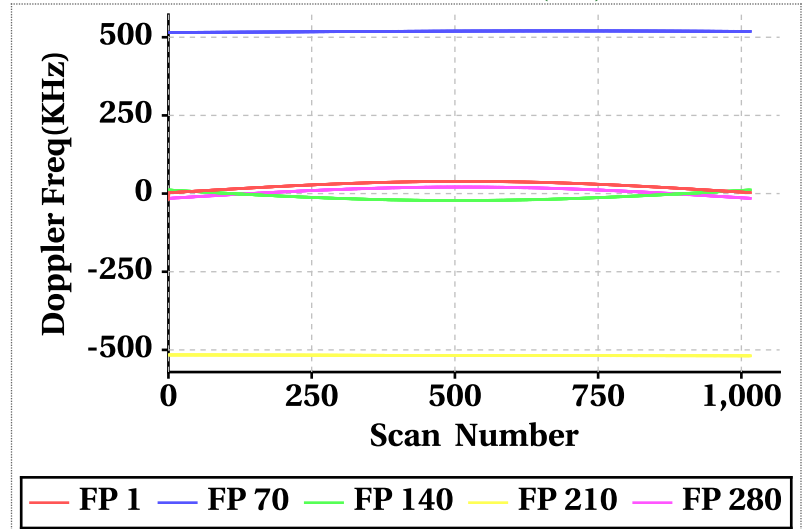
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

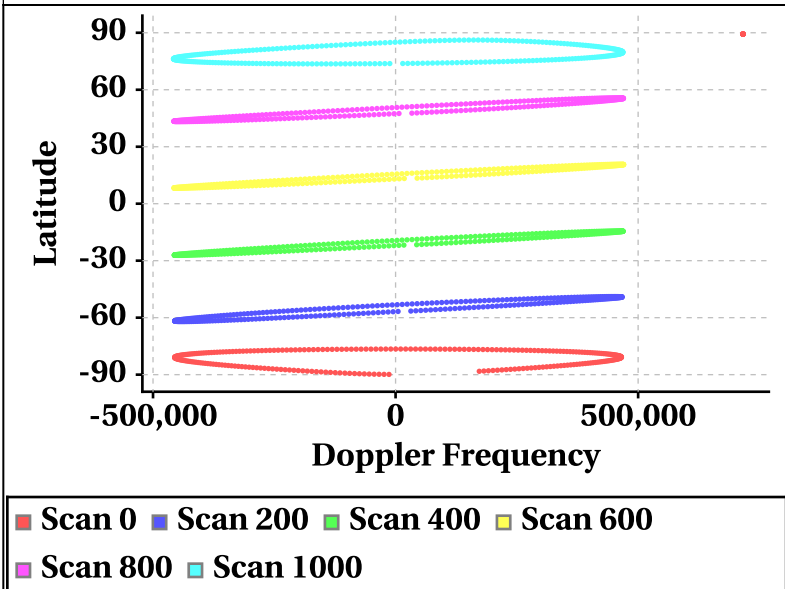


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

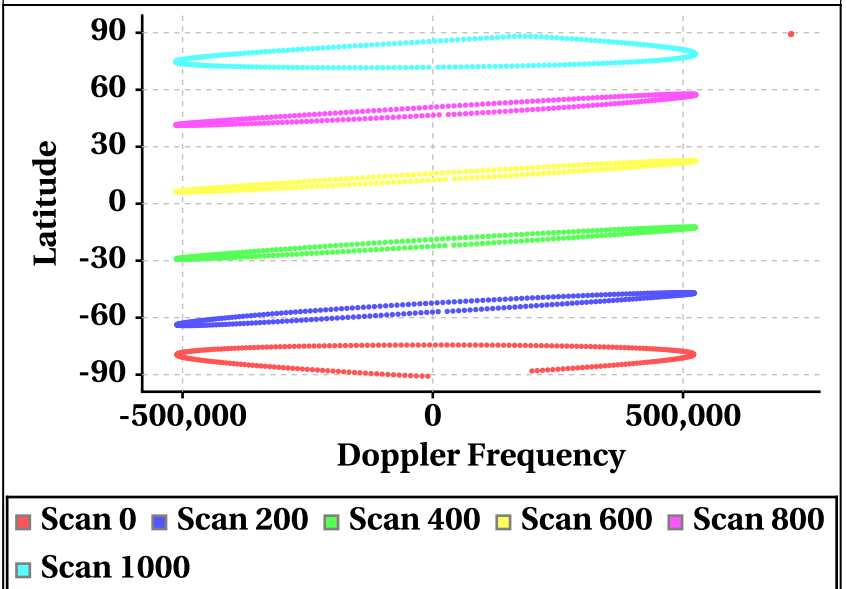


# Latitude Vs Doppler Frequency

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



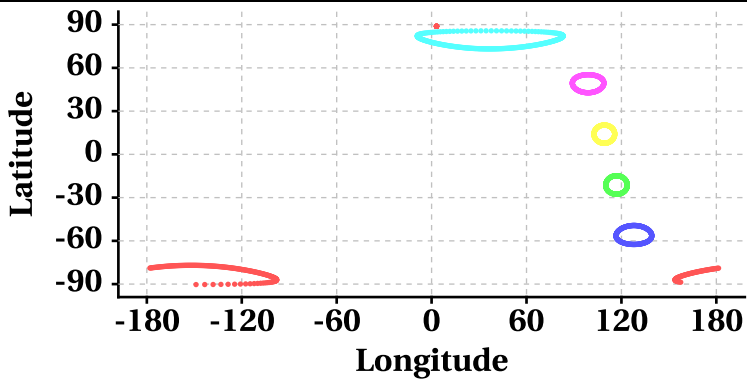
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

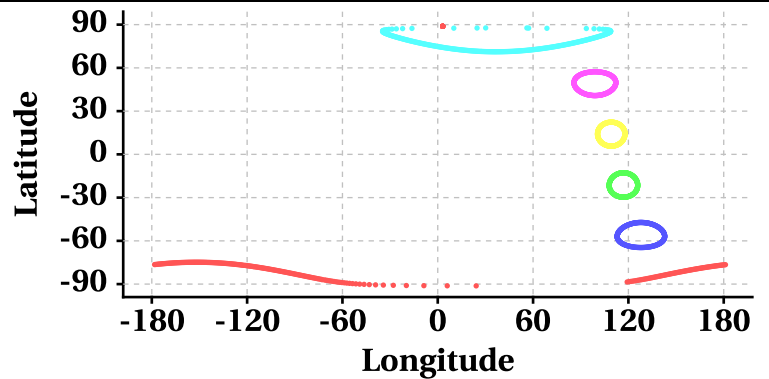
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

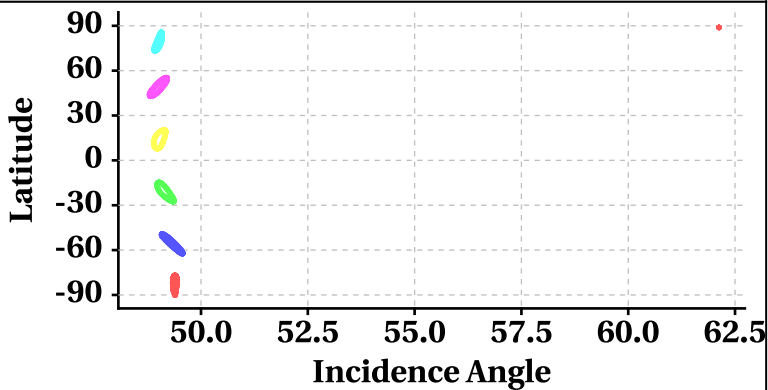
Scan Trace [Outer Beam (VV)]



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

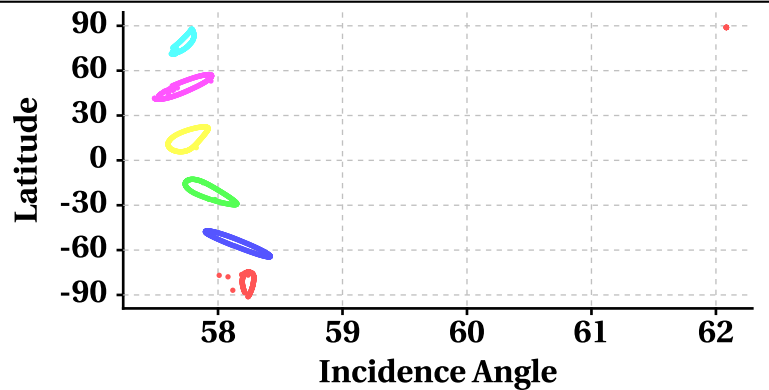
## Latitude Vs Incidence Angle

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



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

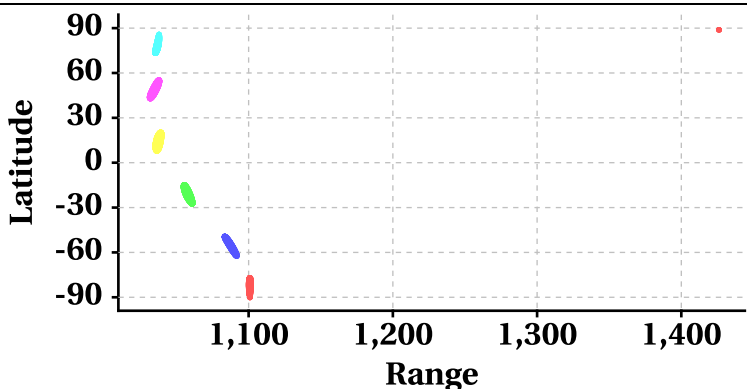
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

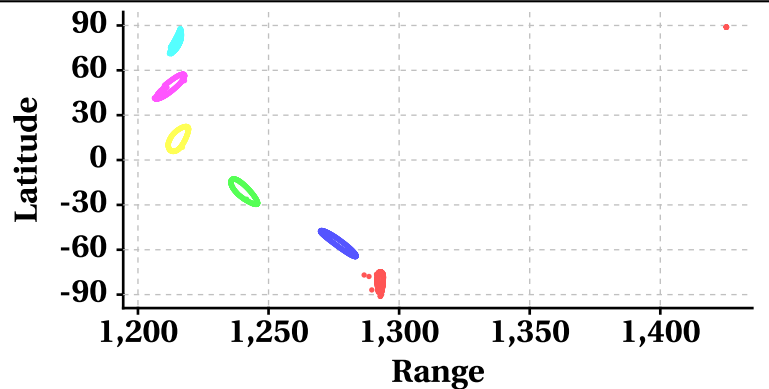
## Latitude Vs Range

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

