

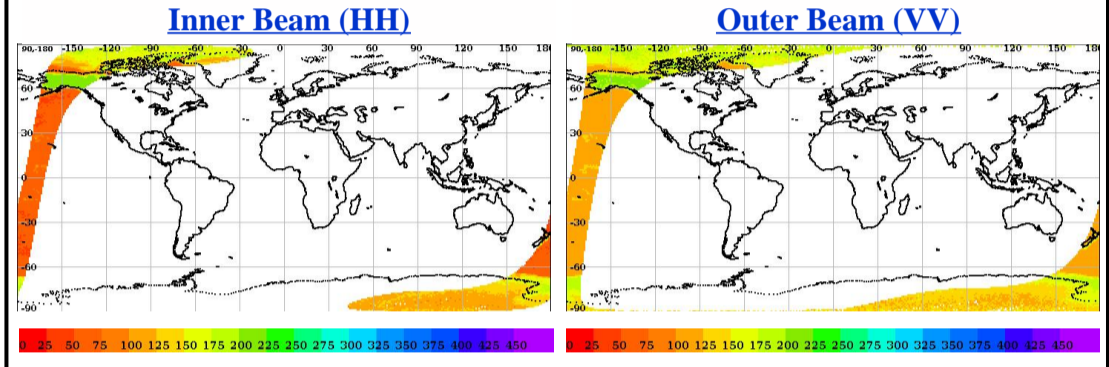
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

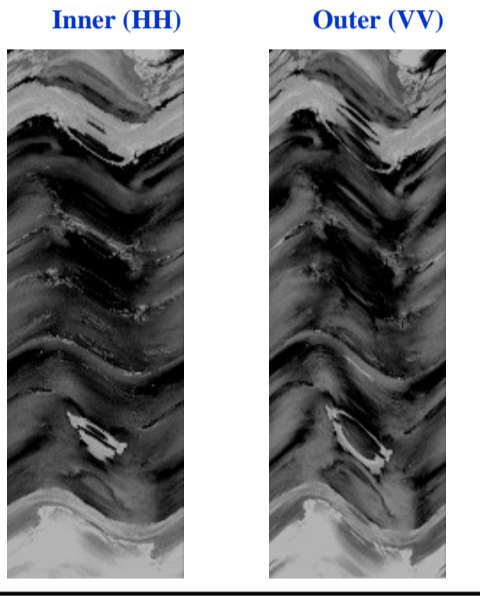
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along 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>	14958	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	14959	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	14958_14959	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	25-07-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	24-07-2019	<b>Equator Crossing Time</b>	19:44:23.000	<b>No Of Outer Slices</b>	15

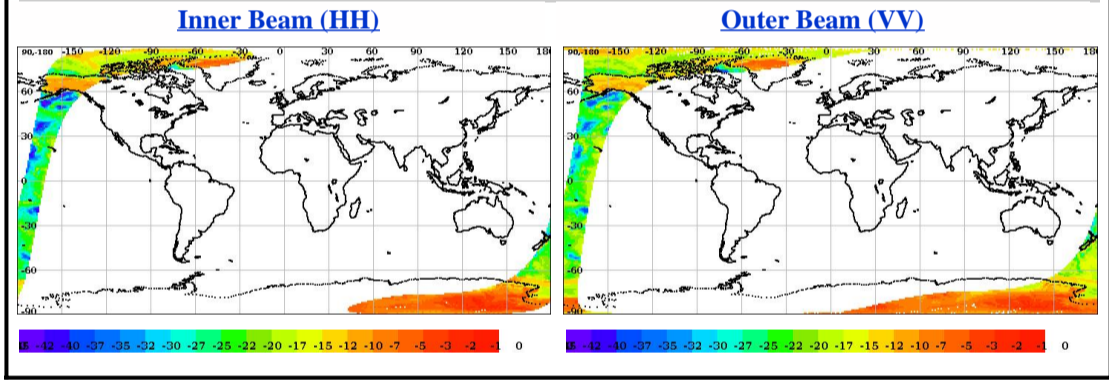
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



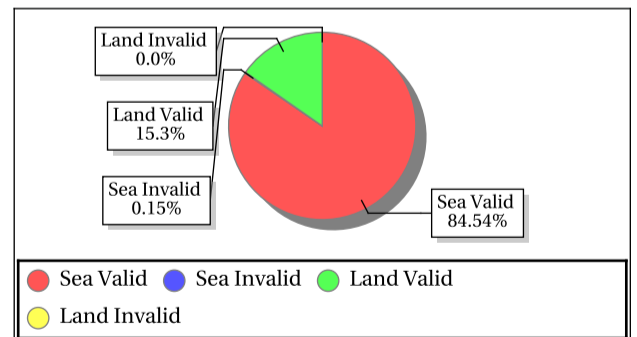
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.15	0.15
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(%)	22.22	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 (%)	0.050051	0.105275

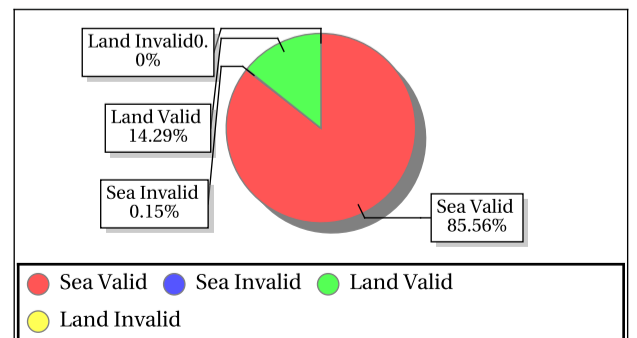
\*DP Format Document

## 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	DSC	Aft	-8.45	-4.89	-6.76	0.84	107.88	155.97	127.60	11.46
ANT_1	-75.00	121.00	Inner	DSC	Fore	-9.03	-5.33	-7.11	1.01	95.33	151.77	118.32	15.49
ANT_1	-75.00	121.00	Outer	DSC	Aft	-8.57	-8.57	-8.57	0.00	138.17	138.17	138.17	0.00
ANT_1	-75.00	121.00	Outer	DSC	Fore	-8.85	-7.08	-7.95	0.62	117.53	168.53	135.67	14.39
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-6.04	-5.17	-5.58	0.36	135.74	178.53	157.11	17.47



## 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	296.21	0.37	3.571	0.12	303.56	0.36	3.124	0.12	0.13	0.12	0.000	0.12	0.12	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>	-34.85	24.29	4.04	0.011	-34.96	25.17	4.63	0.011	7.03	28.05	18.98	19.190	11.07	29.26	20.65	32.984

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	203.65	0.31	2.865	0.09	196.81	0.29	2.576	0.09	6.17	0.09	0.024	0.09	37.29	0.09	0.025
<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>	-34.39	19.52	1.92	0.000	-34.24	19.89	2.27	0.000	-19.16	21.62	12.63	0.000	-27.01	24.06	14.25	0.784

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)

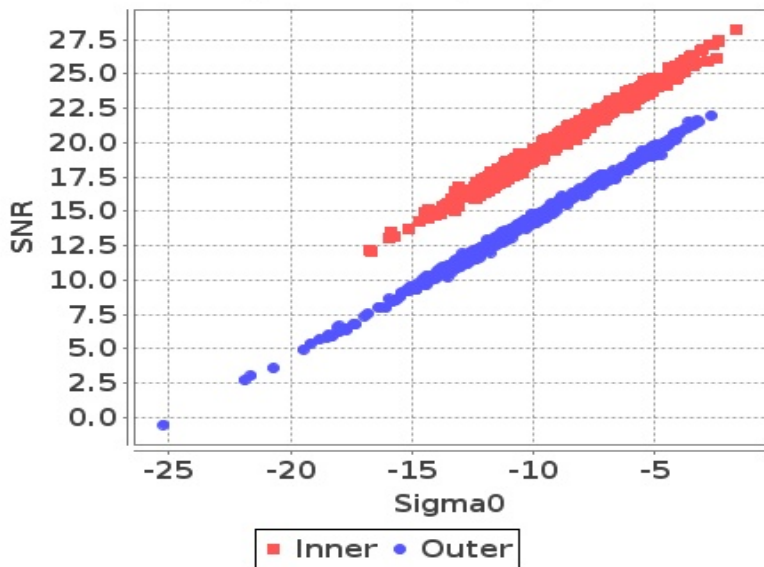
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.73	49.32	49.01	0.000	57.48	58.12	57.88	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0000	210.07	1.27	2.714	0.0000	292.31	1.27	3.862	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1031.52	1077.11	1050.31	0.000	1208.62	1265.05	1229.98	2.979	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.67	-90.02	-90.59	0.000	-93.07	-92.06	-92.20	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.88	16.34	15.98	0.000	10.41	36.57	21.07	3.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.78	10539.57	40.49	4.000	18.36	10768.24	40.92	5.000	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)

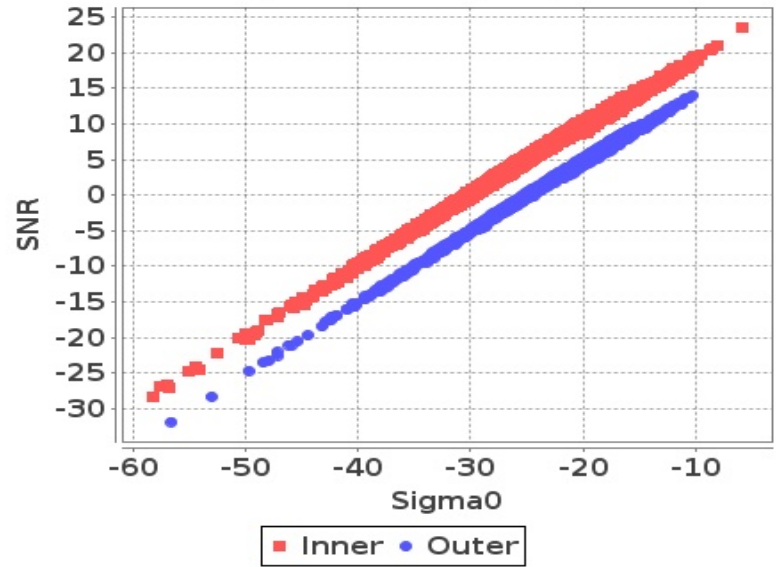
Footprint-Land

Sigma0 Vs SNR (Land)



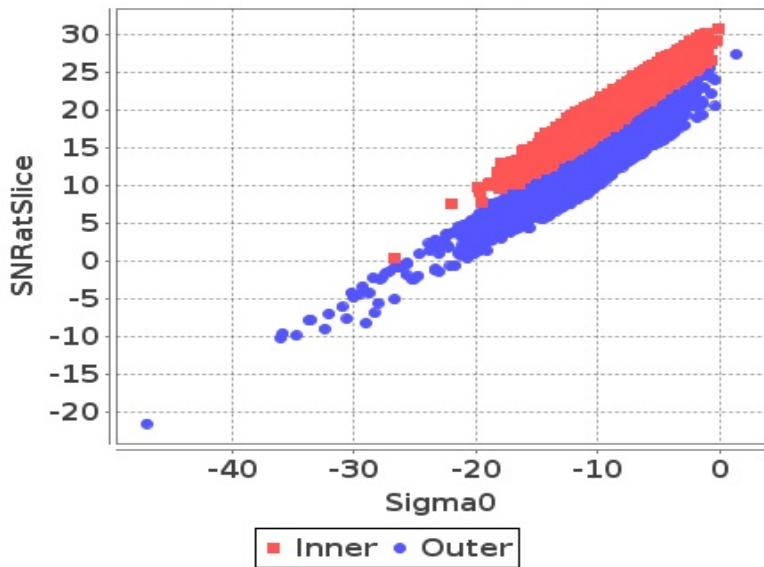
Footprint-Sea

Sigma0 Vs SNR (Sea)



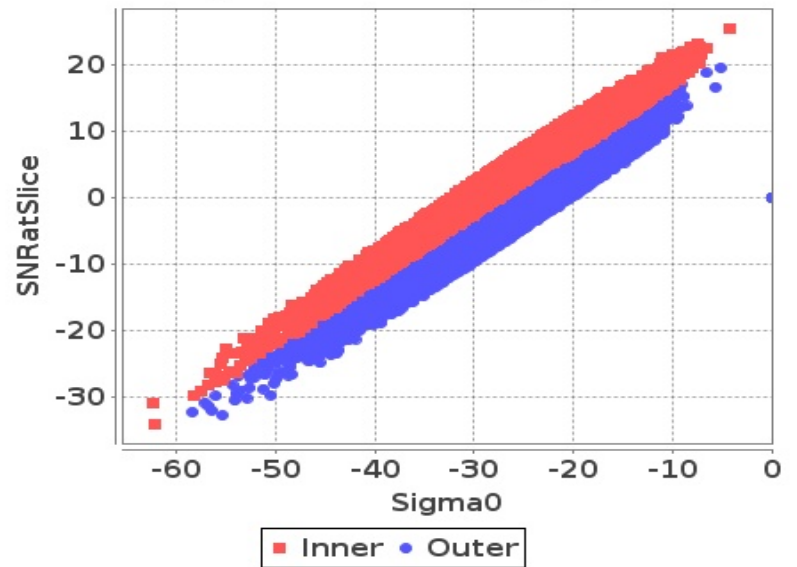
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

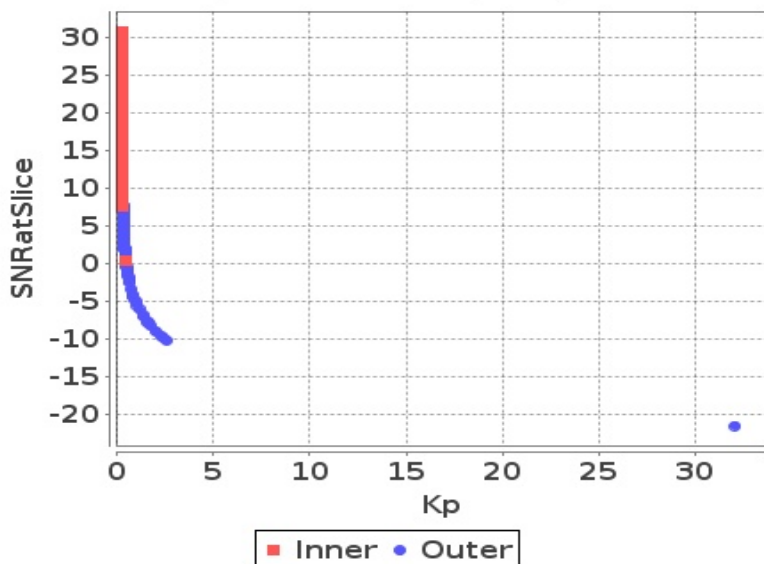
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

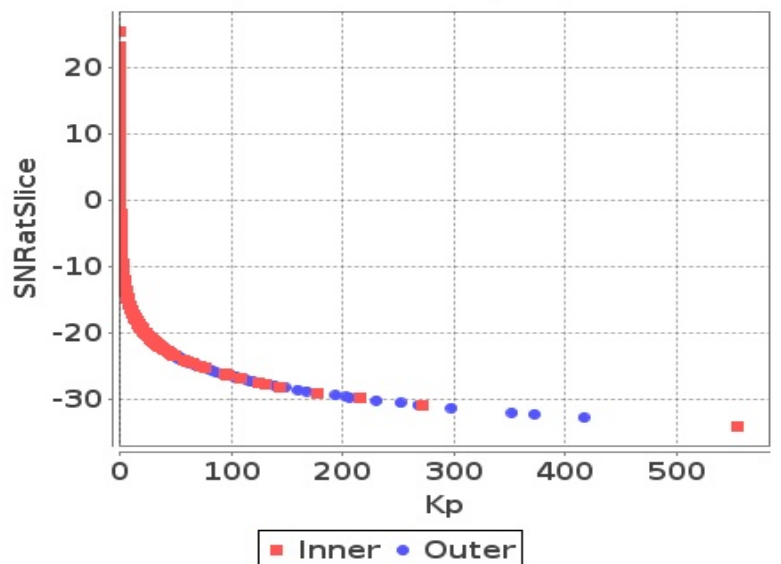
Slice

Kp Vs SNRatSlice (Land)



Slice

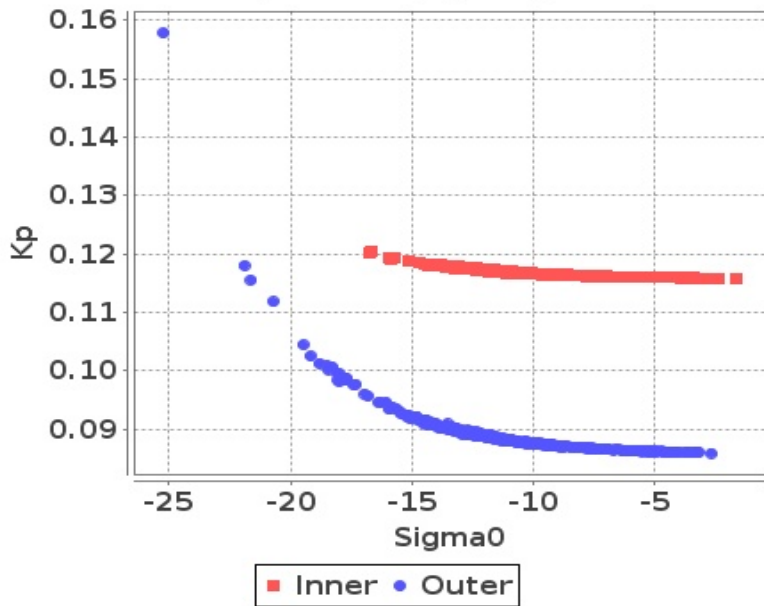
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

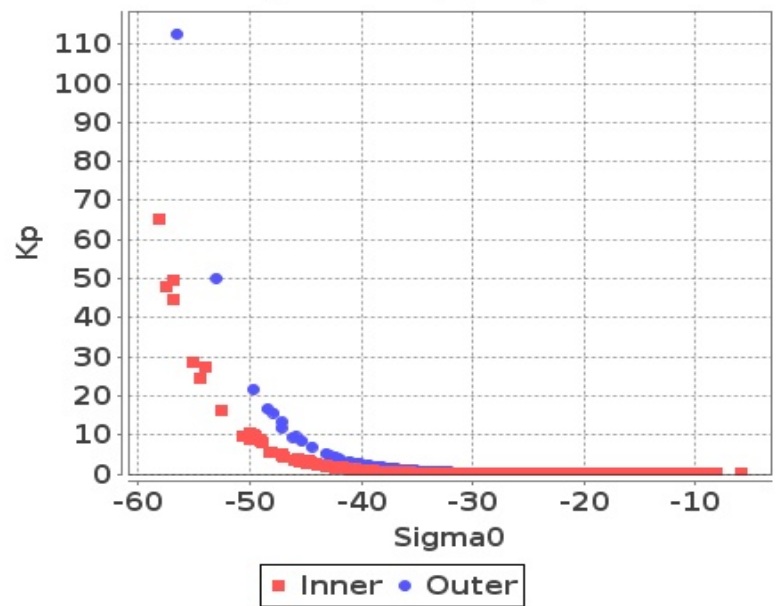
## Footprint-Land

### Sigma0 Vs Kp (Land)



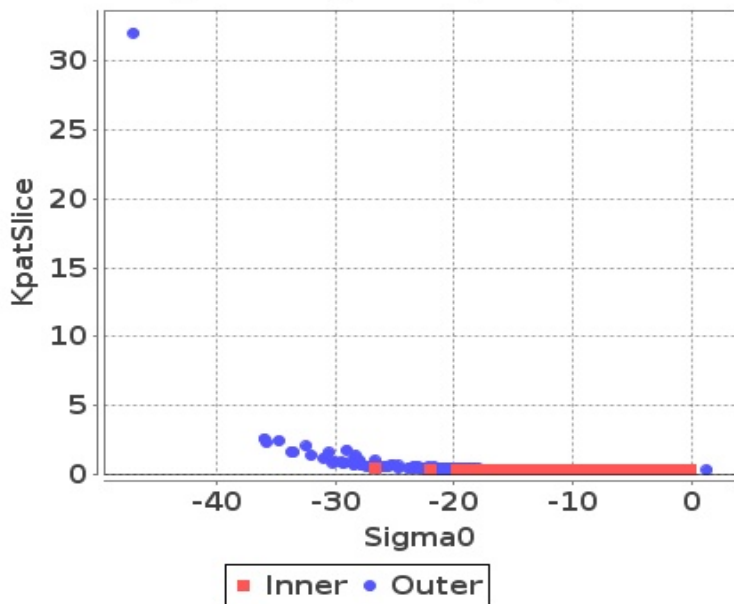
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



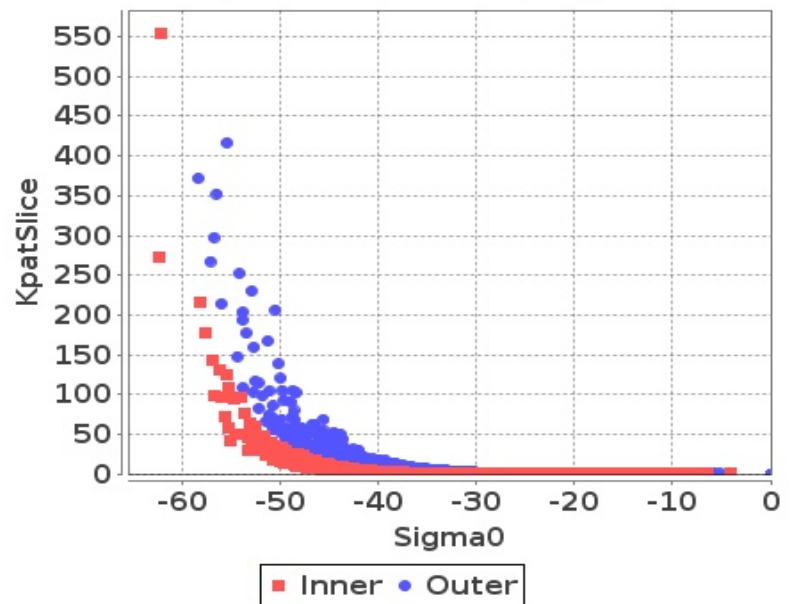
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)



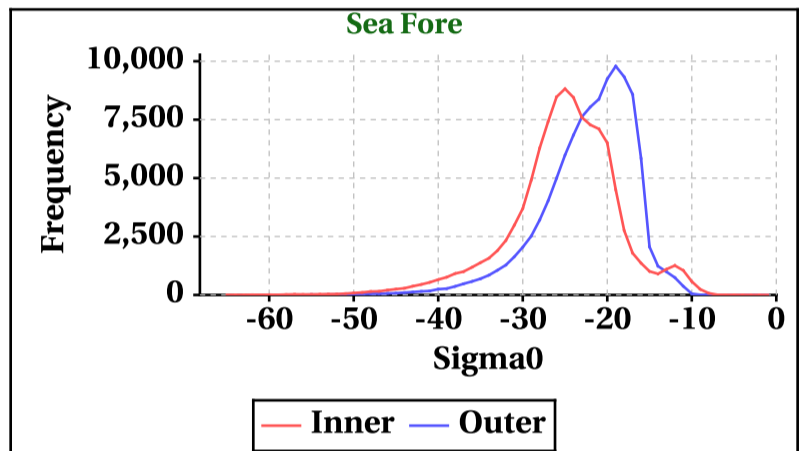
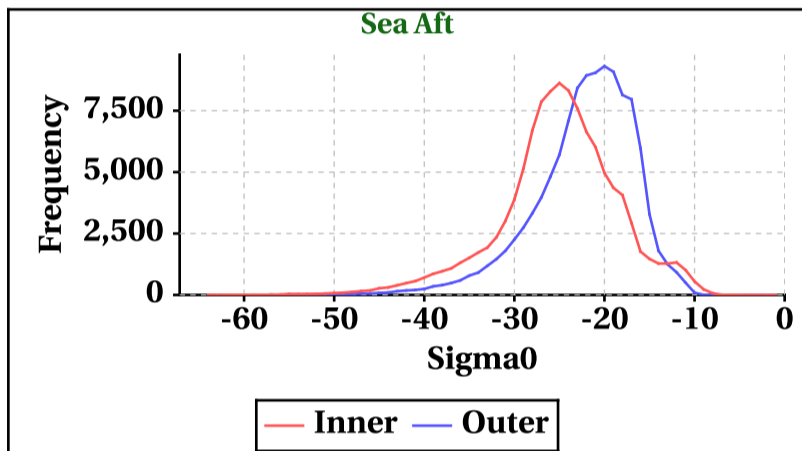
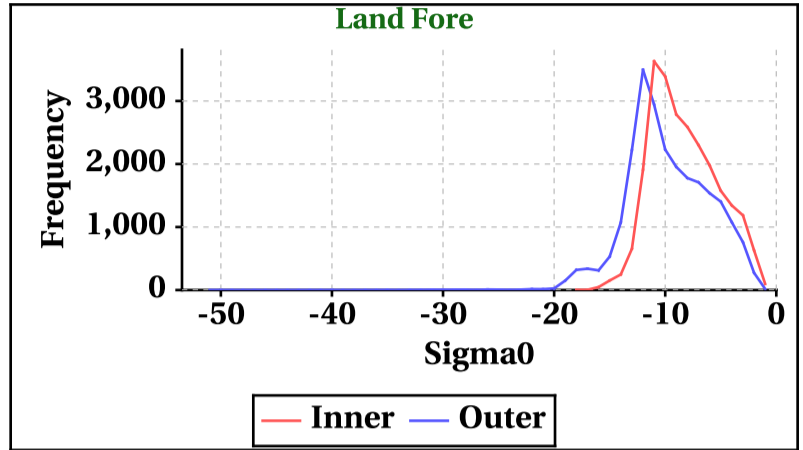
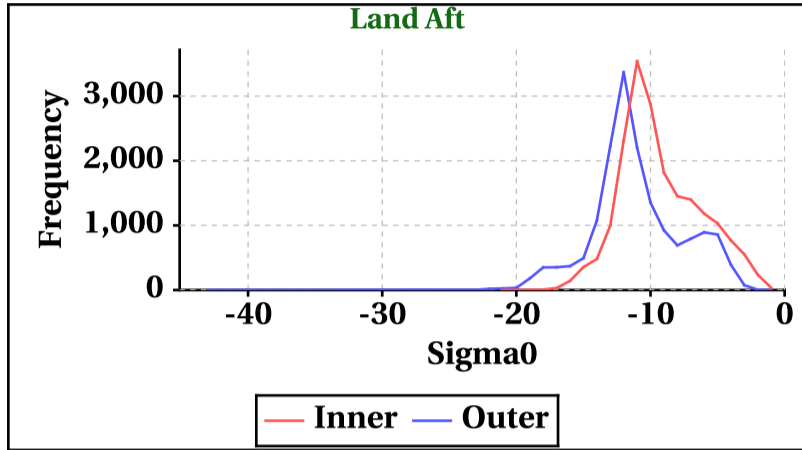


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-21	-18	-64	-65
Max	0	0	0	0

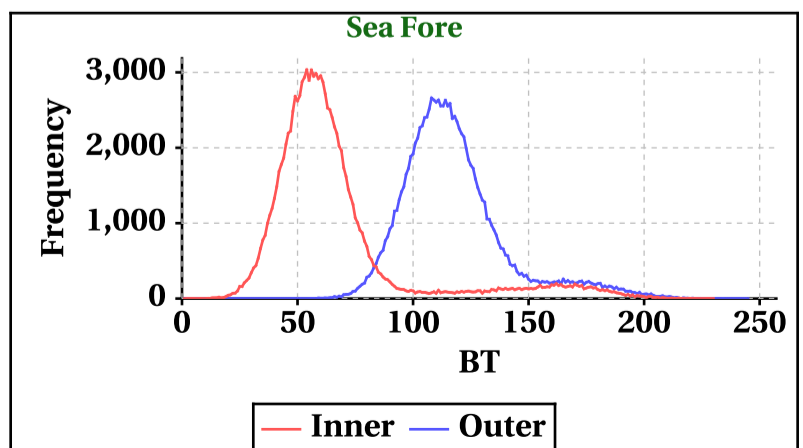
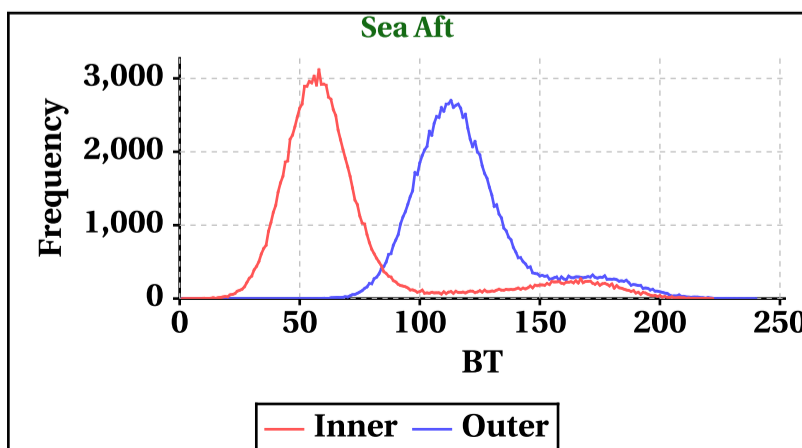
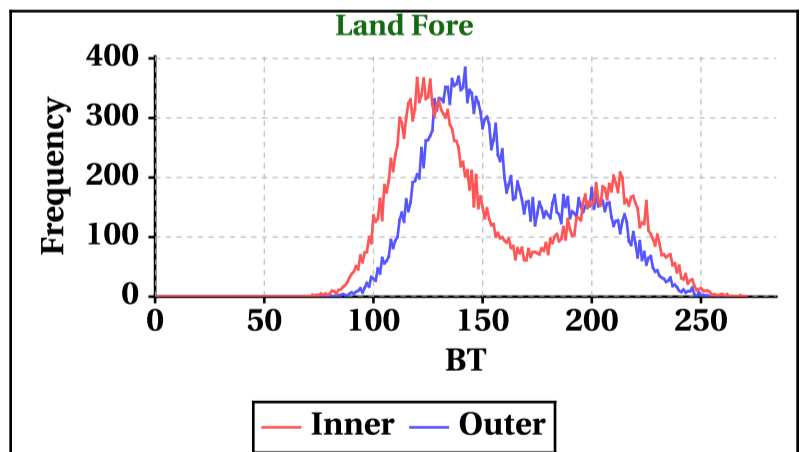
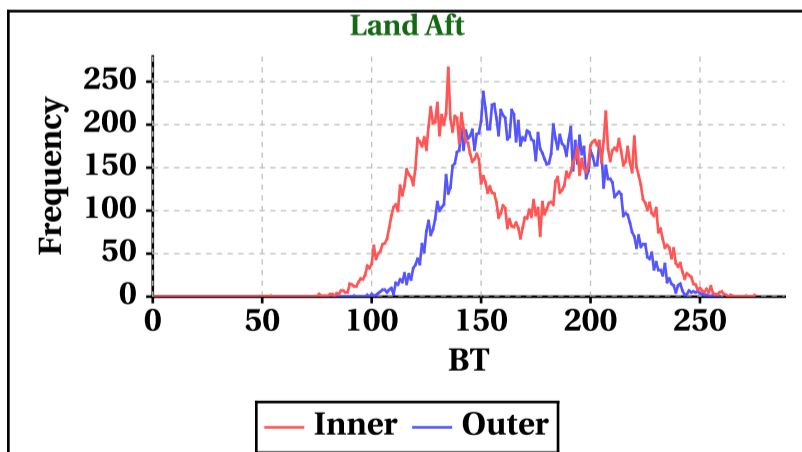
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-43	-51	-59	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	275	271	222	230

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	259	269	240	245

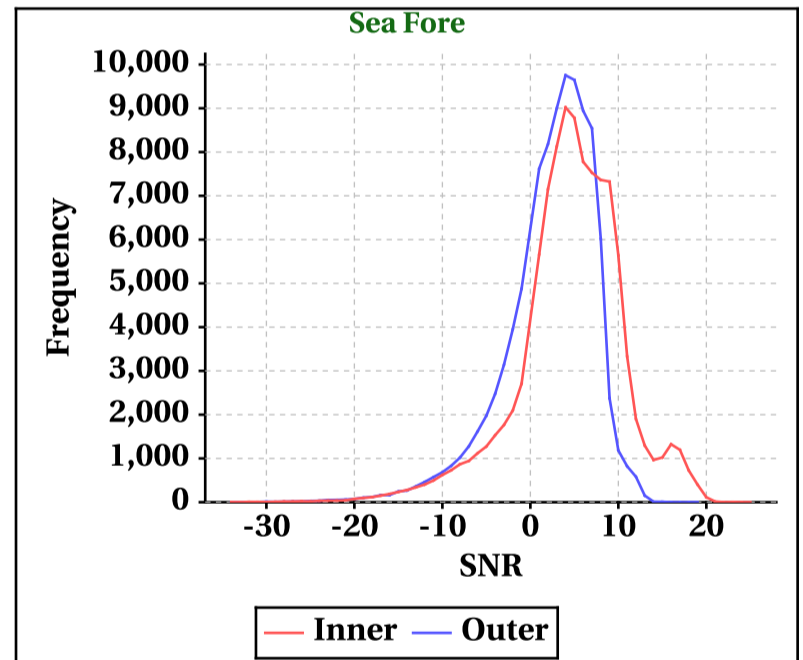
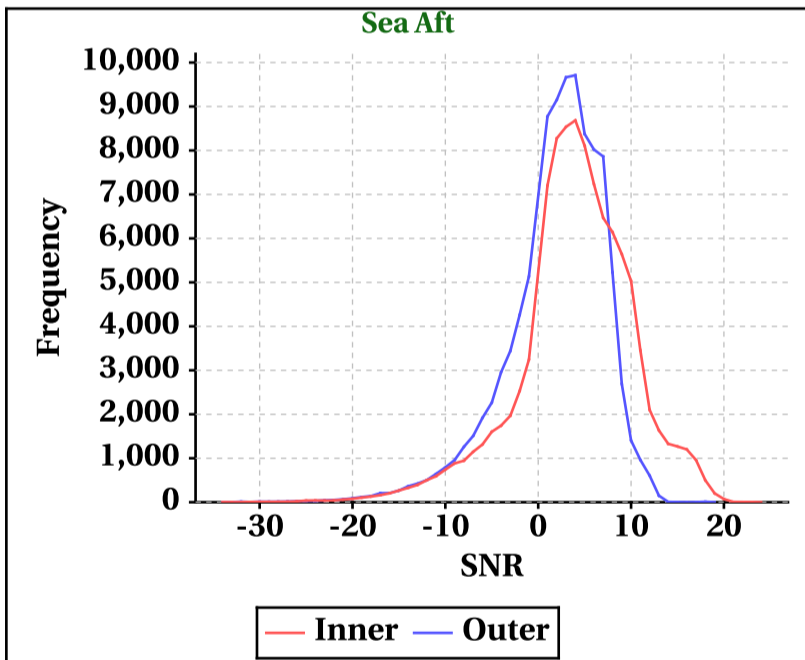
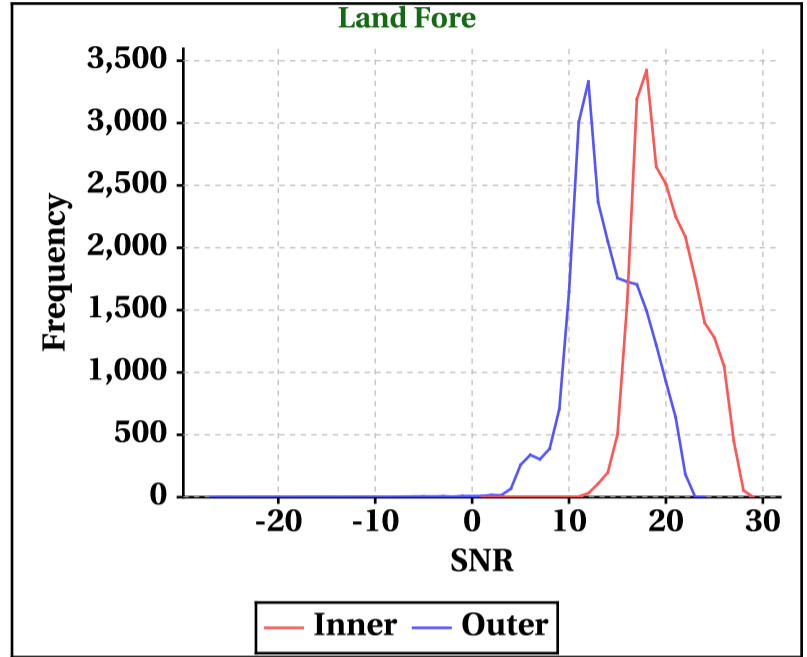
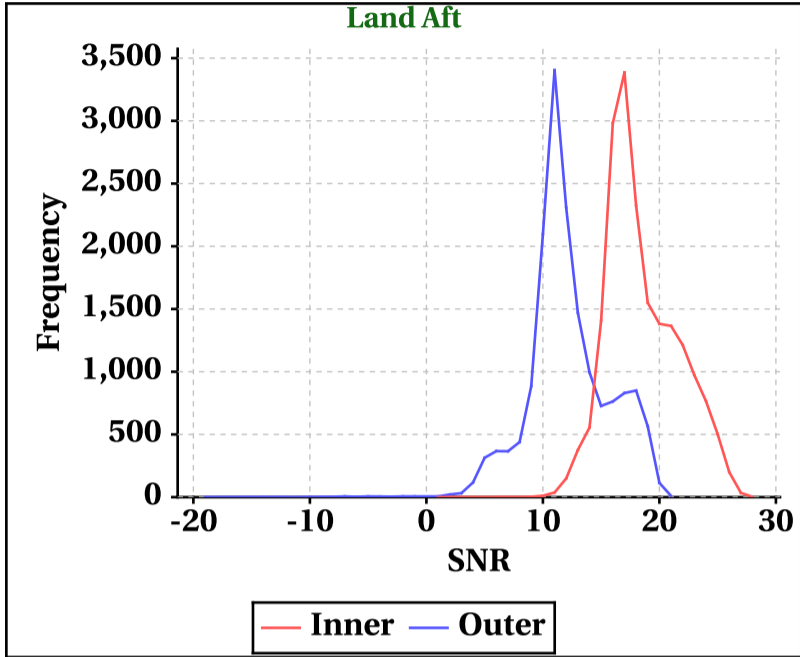


# Dynamic Range (Data Histograms)

## SNR(dBm)

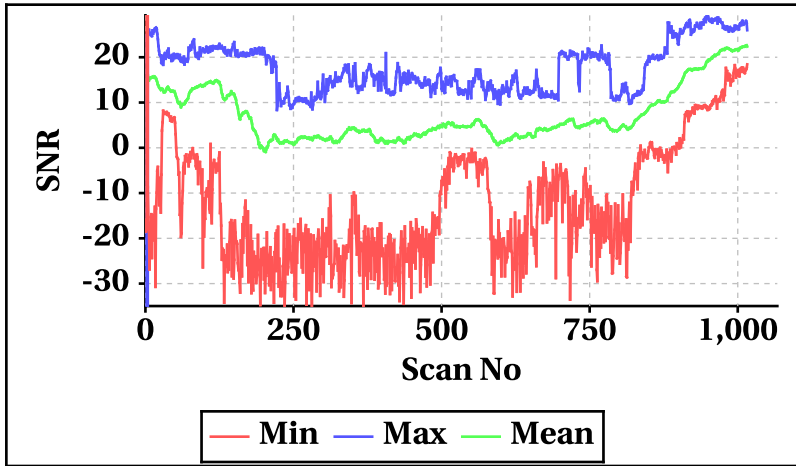
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	28	29	24	25

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-19	-27	-34	-34
Max	21	24	19	19

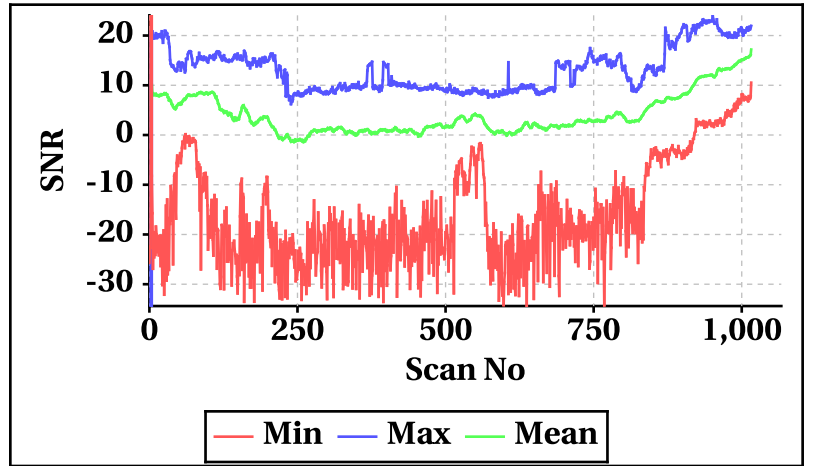


## Orbit-wise behaviour of SNR

Inner Beam (HH)

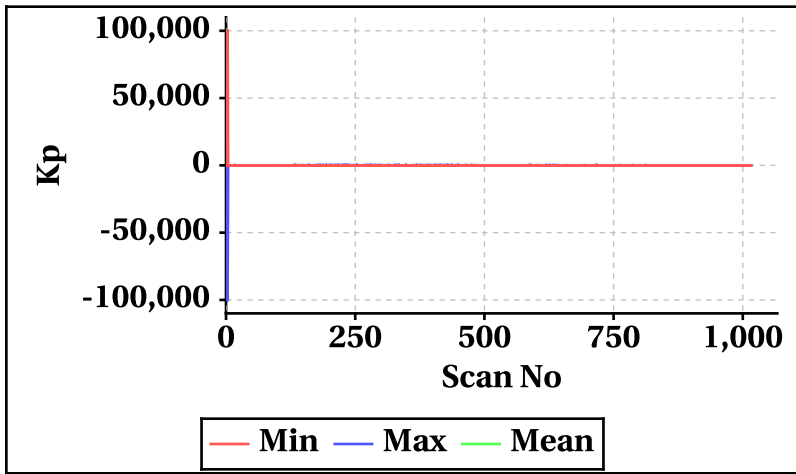


Outer Beam(VV)

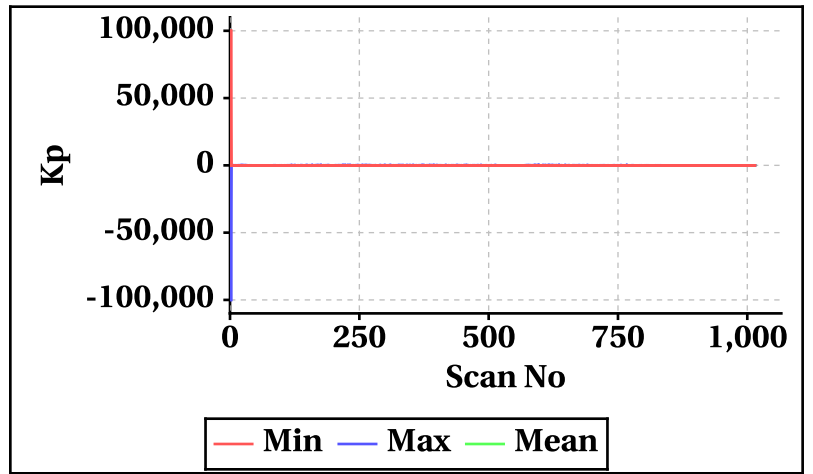


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

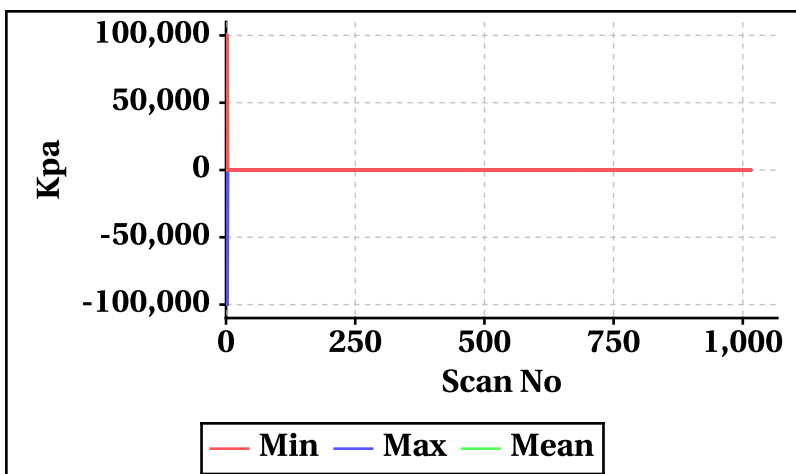
Inner Beam(HH)



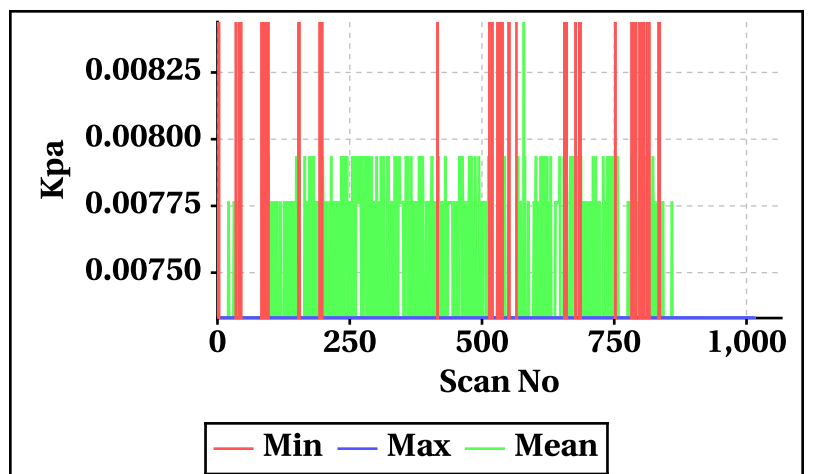
Outer Beam(VV)



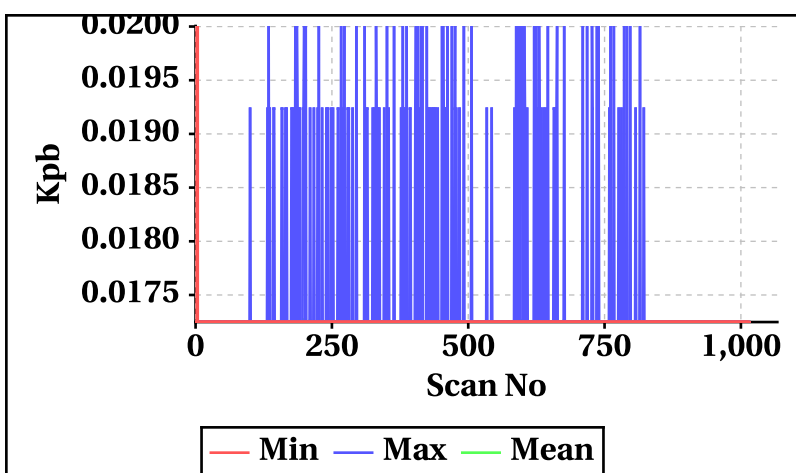
Inner Beam(HH)



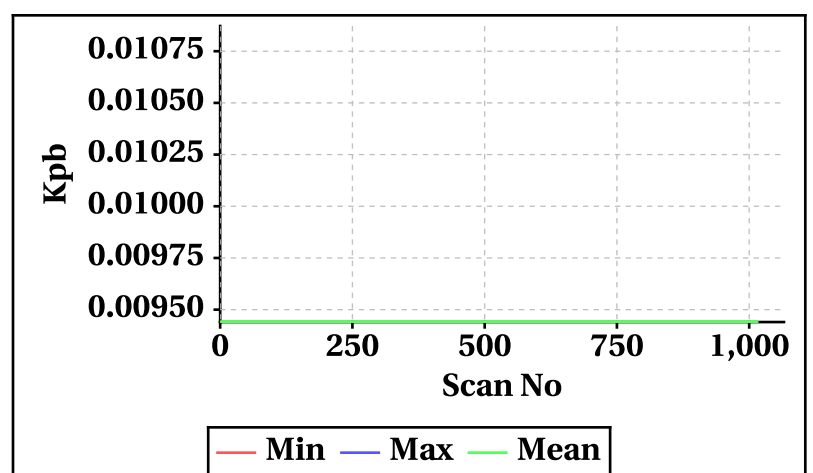
Outer Beam(VV)



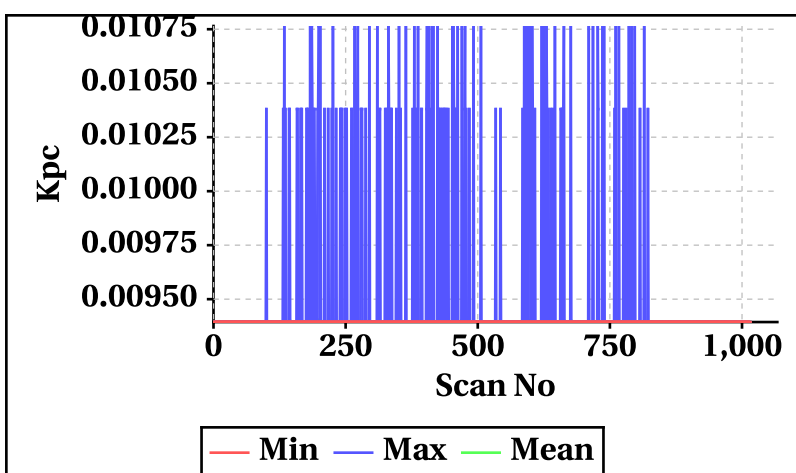
Inner Beam(HH)



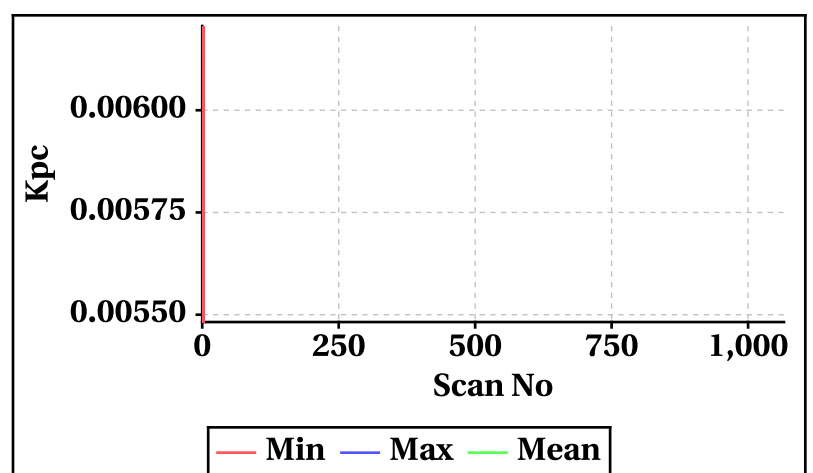
Outer Beam(VV)



Inner Beam(HH)



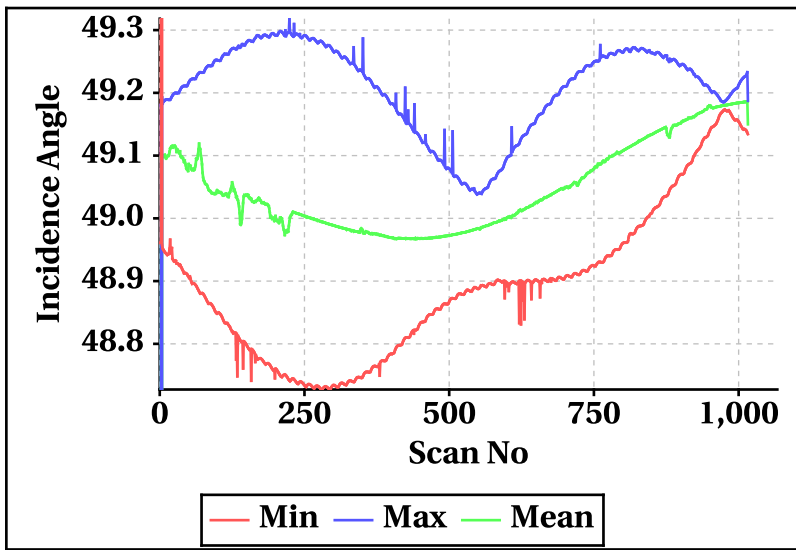
Outer Beam(VV)



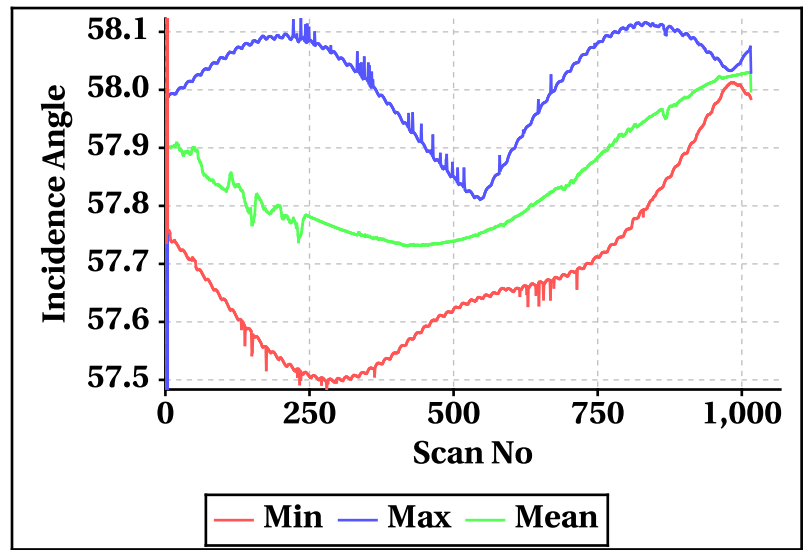


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

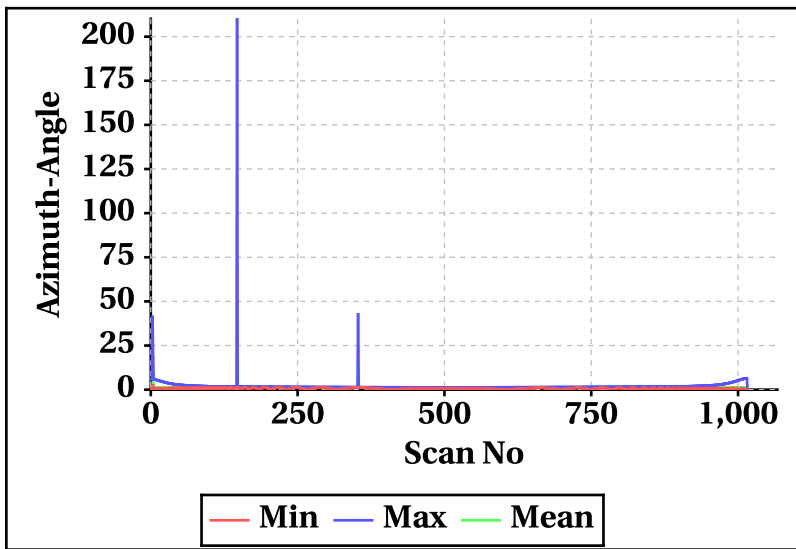
Inner Beam (HH)



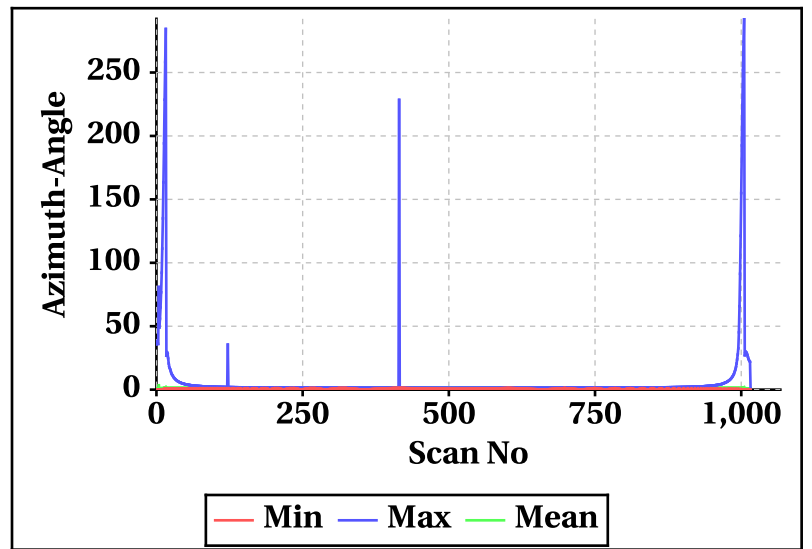
Outer Beam(VV)



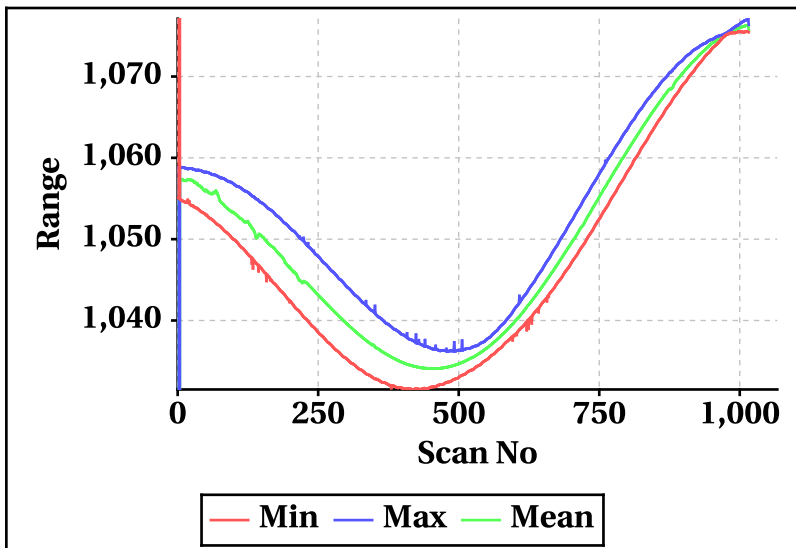
Inner Beam (HH)



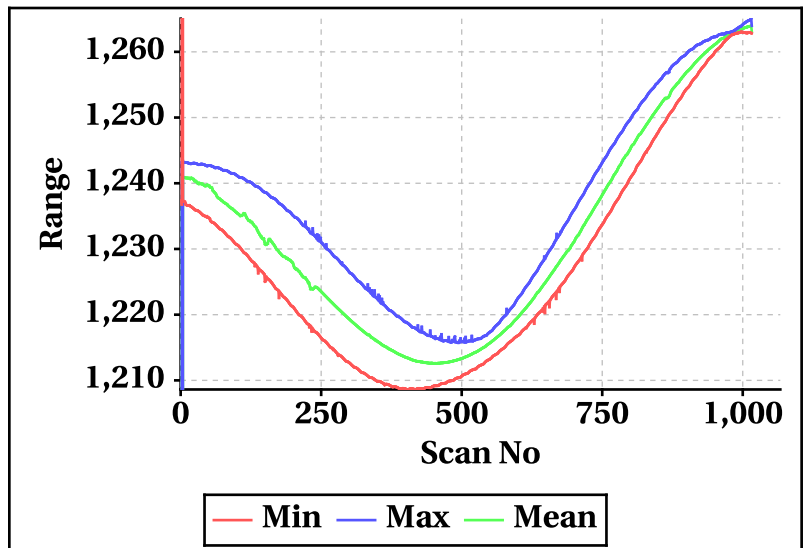
Outer Beam(VV)



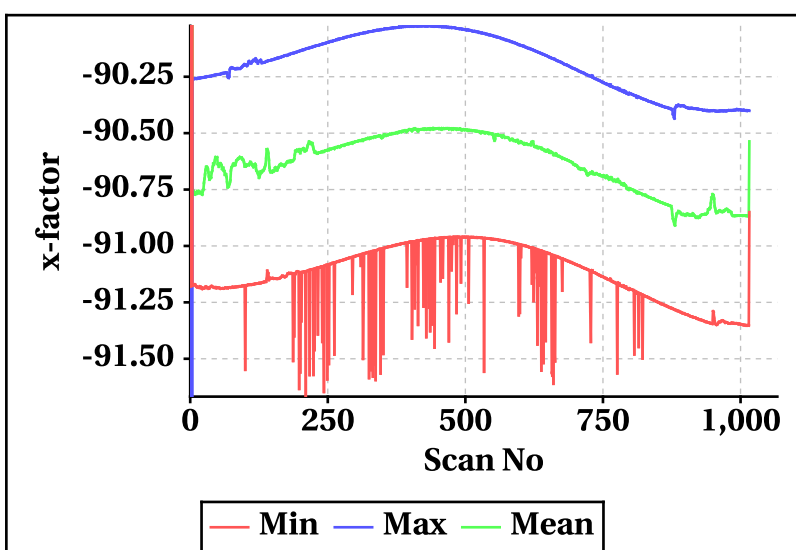
Inner Beam (HH)



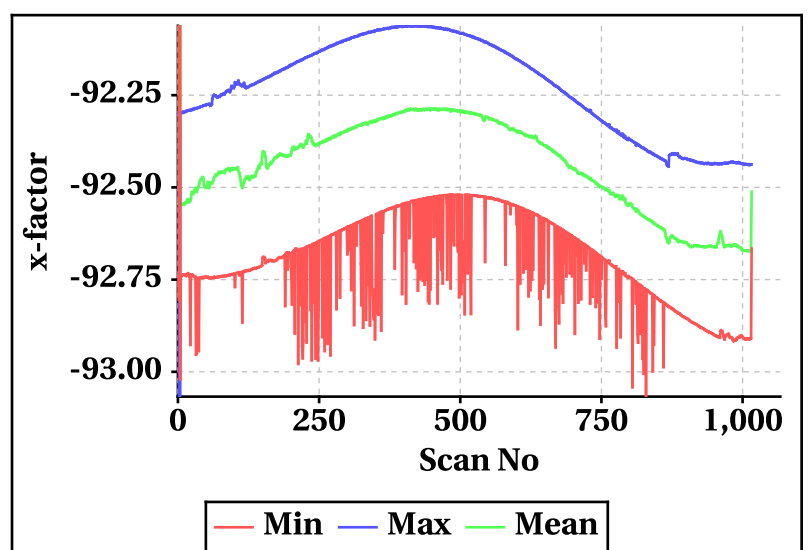
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

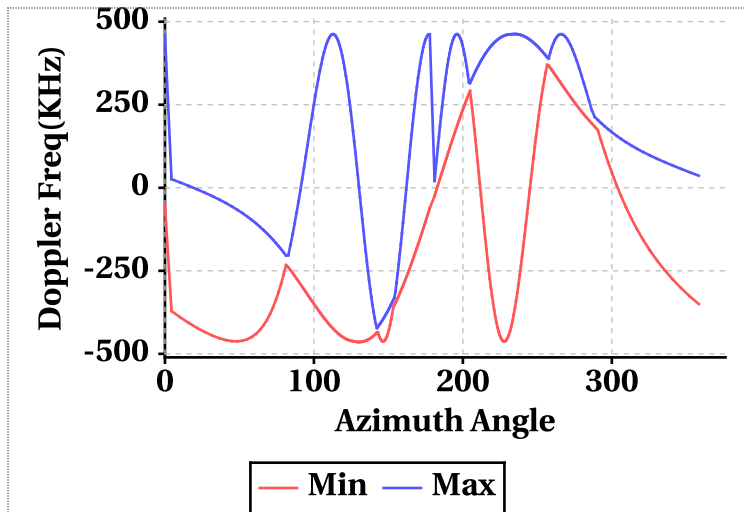


# Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-464.22	-520.08
Max	462.74	518.76

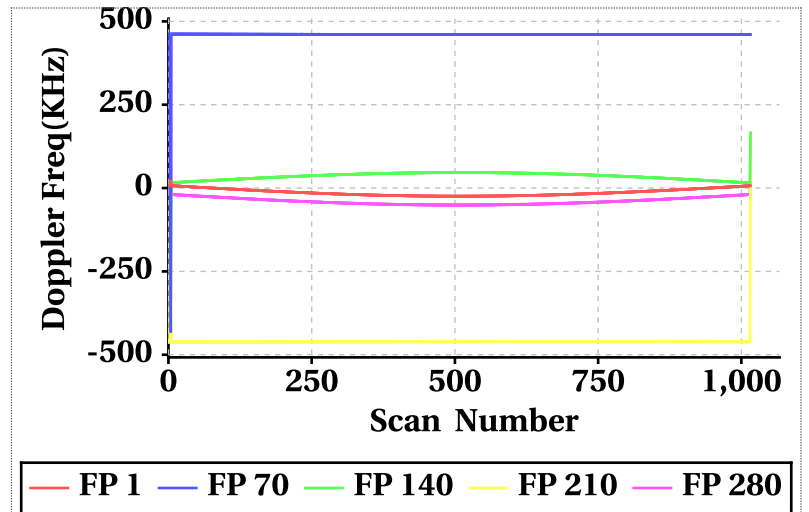
Footprint wise Doppler frequency variation Inner Beam (HH)



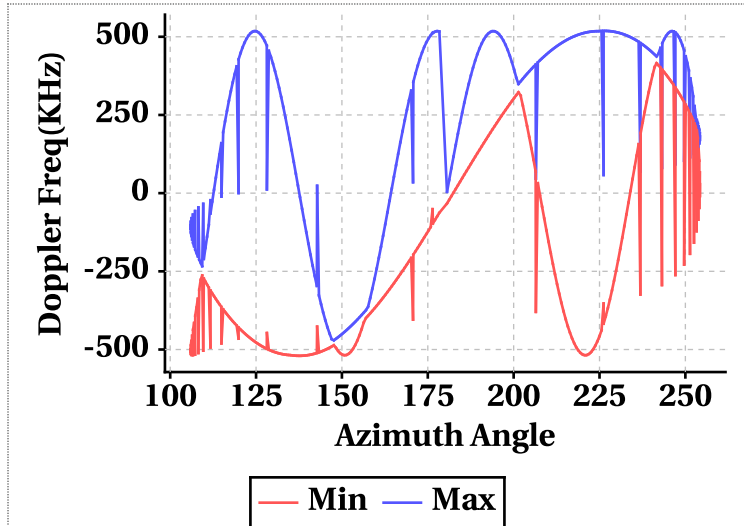
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-24.46	20.52	-12.88	-32.90	4.18	-19.96
Doppler_70	-429.66	462.00	459.71	-488.14	517.66	514.95
Doppler_140	-326.94	165.42	35.00	-379.60	190.78	33.52
Doppler_210	-461.76	170.70	-459.48	-517.72	190.78	-515.33
Doppler_280	-51.06	459.72	-38.62	-51.20	512.96	-37.31

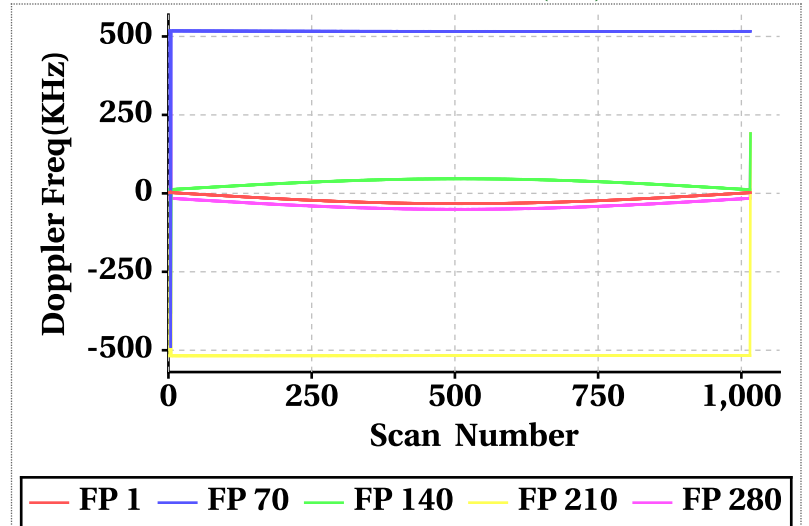
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

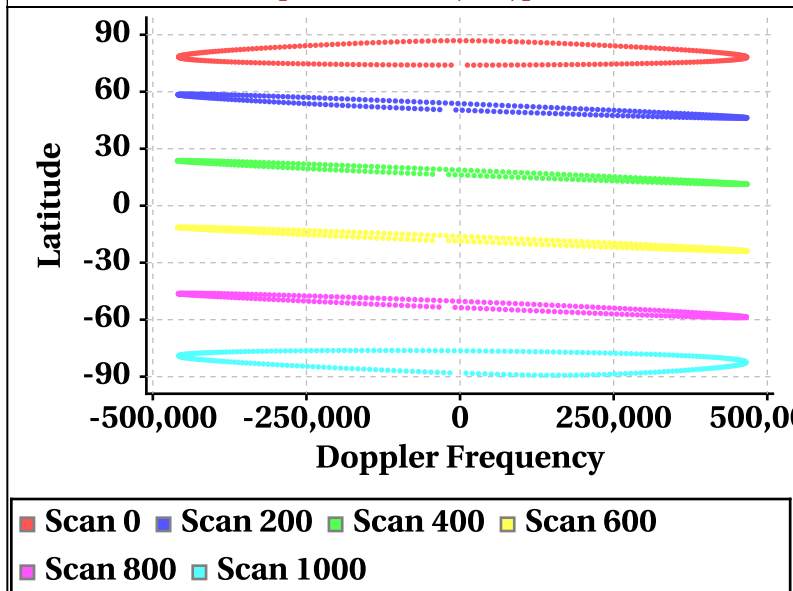


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

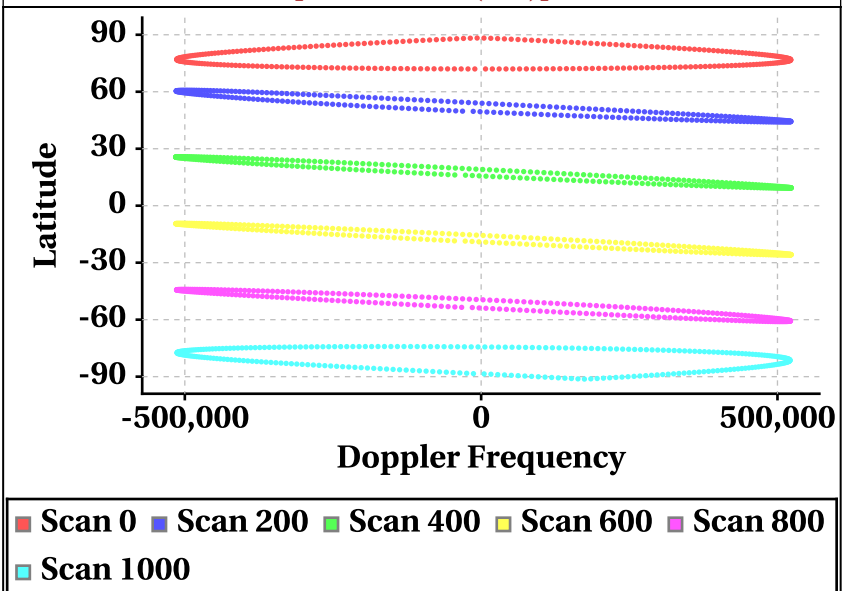


# Latitude Vs Doppler Frequency

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



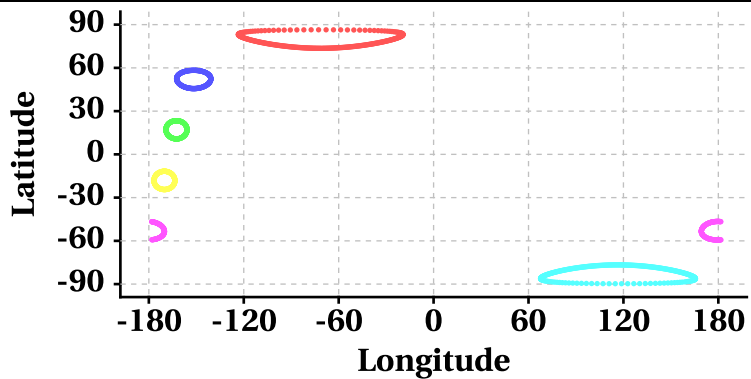
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

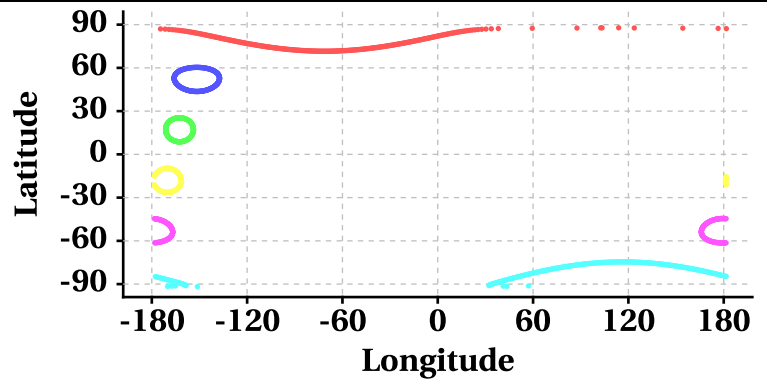
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

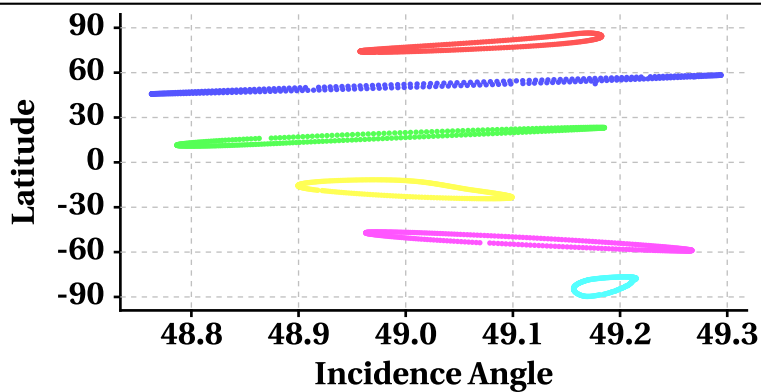
Scan Trace [Outer Beam (VV)]



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

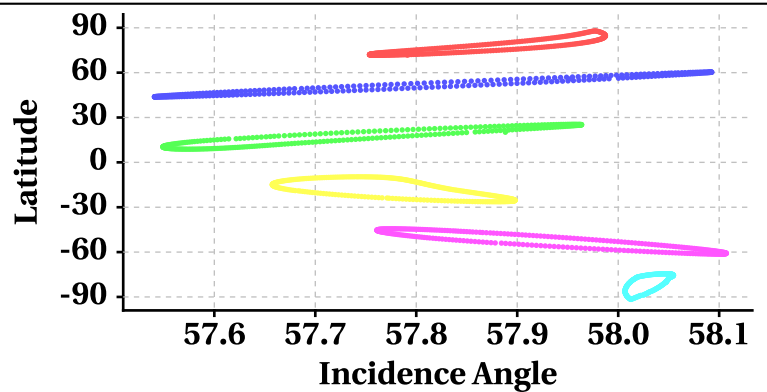
## Latitude Vs Incidence Angle

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



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

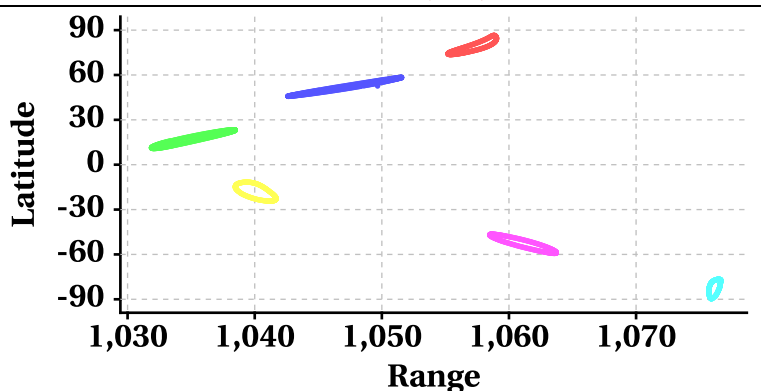
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

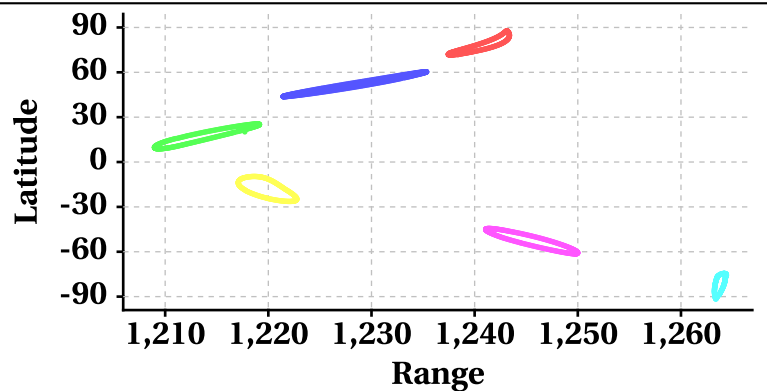
## Latitude Vs Range

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

