

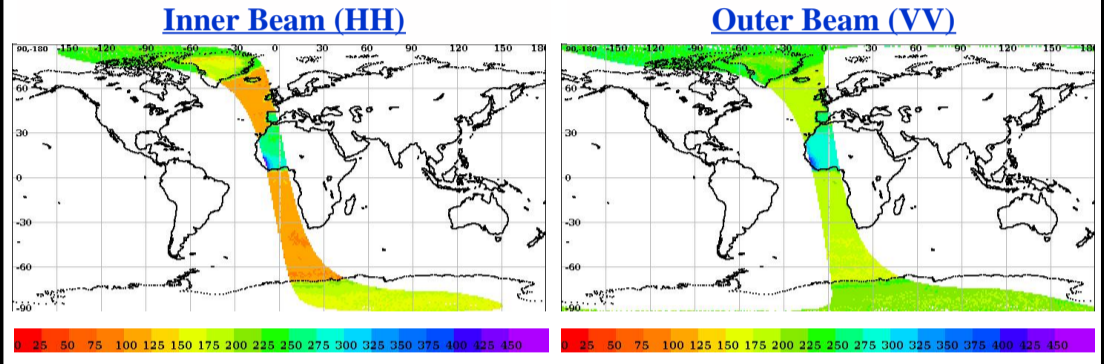
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

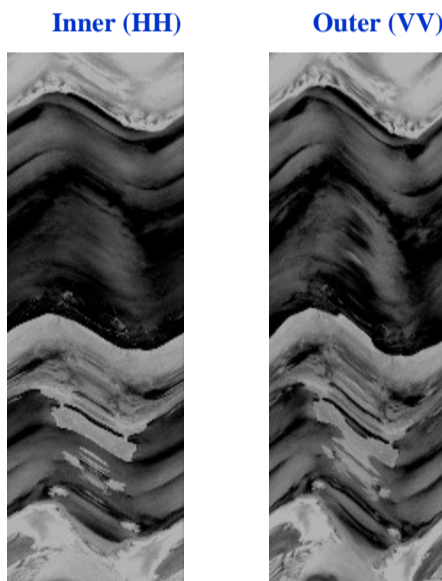
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along 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>	13044	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	13045	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	13044_13045	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	14-03-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	14-03-2019	<b>Equator Crossing Time</b>	20:38:33.000	<b>No Of Outer Slices</b>	15

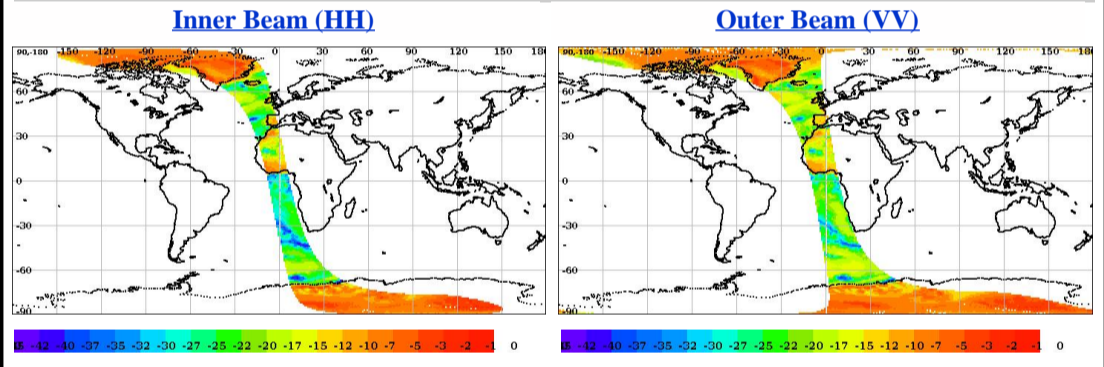
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



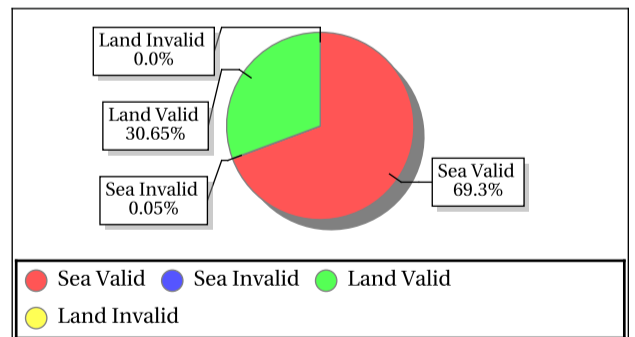
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
<b>Invalid Sigma0(%)</b>	0.02	0.52
<b>Data Not Available From Payload (%)</b>	67.21992	2.416215
<b>Slice not within sample array limits (%)</b>	32.78	97.58
<b>C(S+N) - C(N) &lt; 0.1 (%)</b>	0.00	0.00
<b>Poor Sigma0(%)</b>	22.25	13.34
<b>Noise samples for blending Saturated</b>	0.16041	0.0
<b>Count samp. for interpol. saturated (%)</b>	0.00	0.00
<b>Sigma0 &lt; lower bound (-96dB) (%)</b>	0.0	0.0
<b>Sigma0 &gt; upper bound (0 dB) (%)</b>	0.00	0.00
<b>SNR &lt; -65 dB (%)</b>	0.023765	0.056296

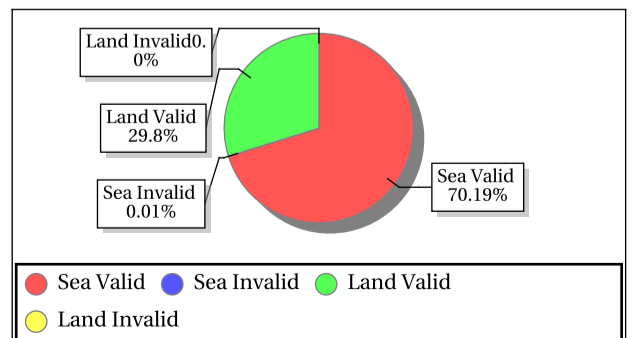
\*DP Format Document

## 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	ASC	Aft	-6.36	-4.77	-5.51	0.54	146.44	185.28	165.30	11.94
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-6.14	-5.01	-5.57	0.57	162.46	189.17	175.82	13.35
GreenLand_3	71.55	-42.45	Inner	ASC	Aft	-13.48	-10.35	-11.63	0.71	171.57	209.61	194.62	10.83
GreenLand_3	71.55	-42.45	Inner	ASC	Fore	-12.64	-10.55	-11.61	0.61	173.35	226.20	202.27	15.18
GreenLand_1	74.69	-42.50	Inner	ASC	Aft	-11.73	-7.66	-9.57	1.09	165.06	203.81	182.87	12.50
GreenLand_1	74.69	-42.50	Inner	ASC	Fore	-9.98	-8.40	-9.05	0.48	154.86	200.34	170.03	15.05
ANT_1	-75.00	121.00	Outer	ASC	Aft	-8.95	-7.68	-7.97	0.40	178.28	228.31	207.95	14.53
ANT_1	-75.00	121.00	Outer	DSC	Aft	-8.88	-8.88	-8.88	0.00	222.34	222.34	222.34	0.00
GreenLand_2	77.50	-41.50	Outer	ASC	Aft	-5.93	-5.02	-5.35	0.41	184.65	205.15	193.96	8.47
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-5.25	-4.13	-4.59	0.48	209.60	226.43	215.66	7.64
GreenLand_3	71.55	-42.45	Outer	ASC	Aft	-12.94	-11.48	-12.22	0.42	215.86	267.39	240.80	16.08
GreenLand_3	71.55	-42.45	Outer	ASC	Fore	-12.90	-11.27	-11.96	0.43	217.00	258.68	235.51	11.25
GreenLand_1	74.69	-42.50	Outer	ASC	Aft	-10.96	-8.06	-9.79	0.88	189.88	255.25	222.61	17.96
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-9.56	-7.00	-8.19	0.82	207.37	253.04	234.89	13.74



## 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	238.62	0.24	1.594	0.12	291.41	0.22	1.334	0.12	0.89	0.12	0.000	0.12	0.89	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>	-33.91	26.77	5.72	0.455	-34.78	27.43	6.95	2.936	-9.18	29.24	18.74	26.319	-9.17	30.00	18.99	28.218

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	147.26	0.19	1.188	0.09	202.50	0.21	1.260	0.09	2.07	0.09	0.017	0.09	25.36	0.10	0.059
<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>	-32.98	20.50	3.85	0.000	-34.37	20.41	4.77	0.000	-14.32	23.53	13.33	0.556	-25.33	23.75	13.07	0.643

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>	48.67	49.37	49.01	0.000	57.45	58.12	57.85	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	6.28	1.27	2.602	0.0000	290.93	1.27	3.798	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1018.18	1073.70	1041.09	22.466	1192.70	1260.86	1221.25	38.310	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.50	-89.74	-90.29	0.000	-92.89	-91.79	-92.12	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.59	16.11	15.80	0.000	5.51	36.54	20.90	6.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.68	1345.91	32.75	12.000	9.30	36.62	19.69	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

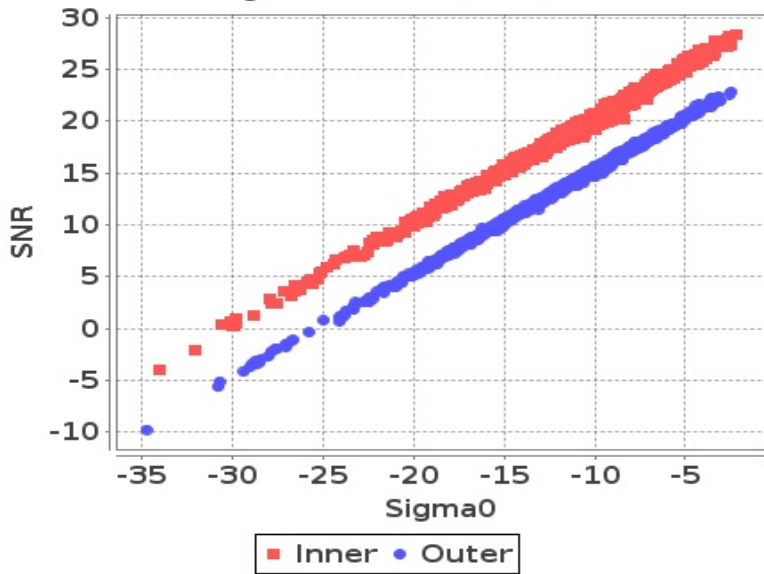
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

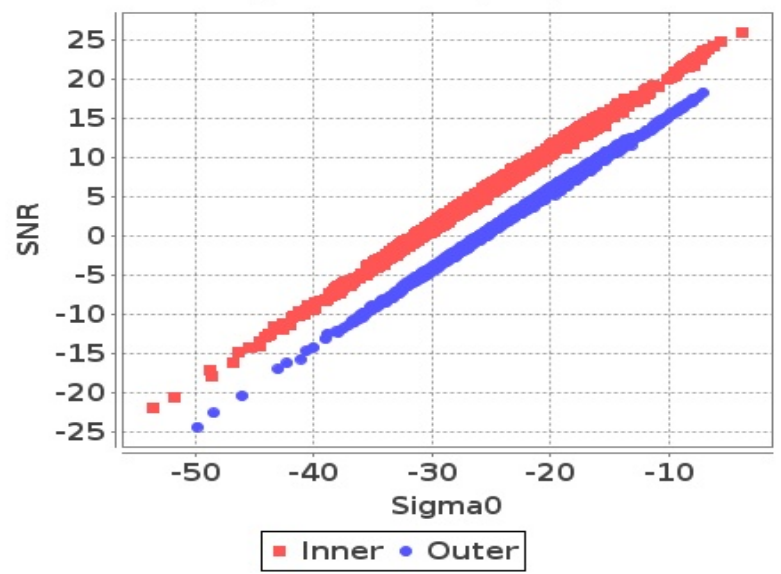
Footprint-Land

Sigma0 Vs SNR (Land)



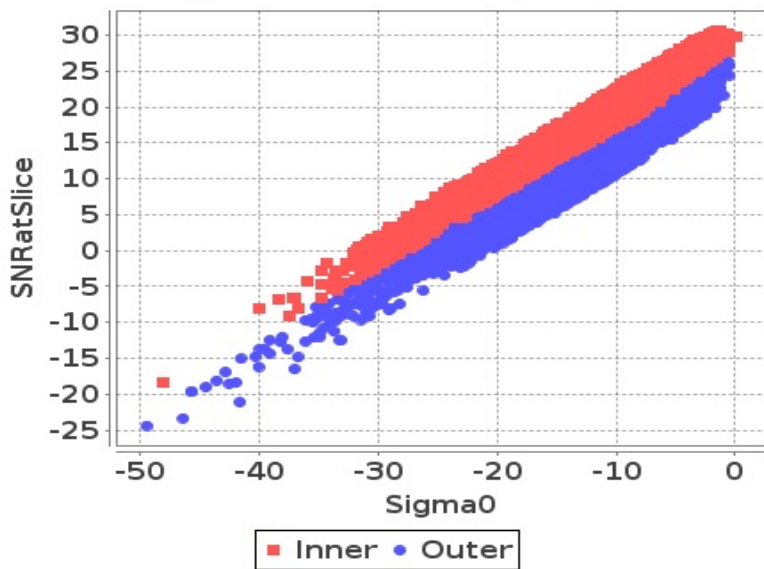
Footprint-Sea

Sigma0 Vs SNR (Sea)



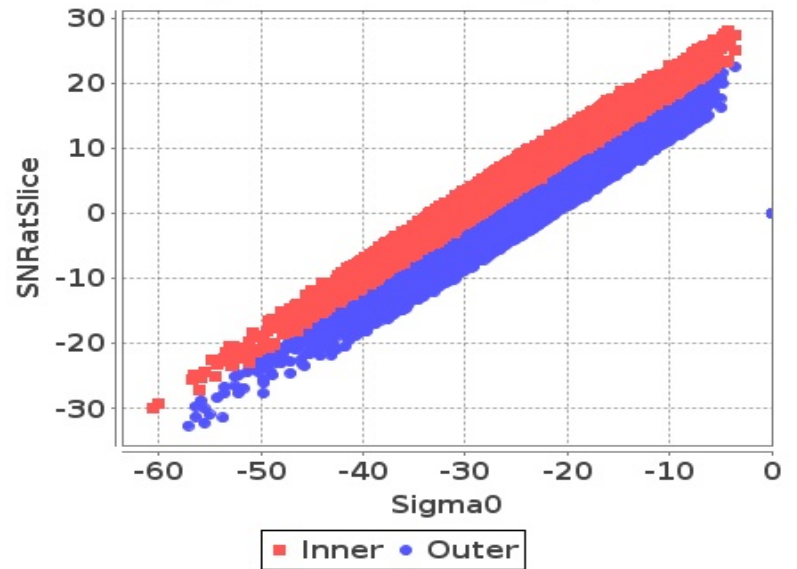
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

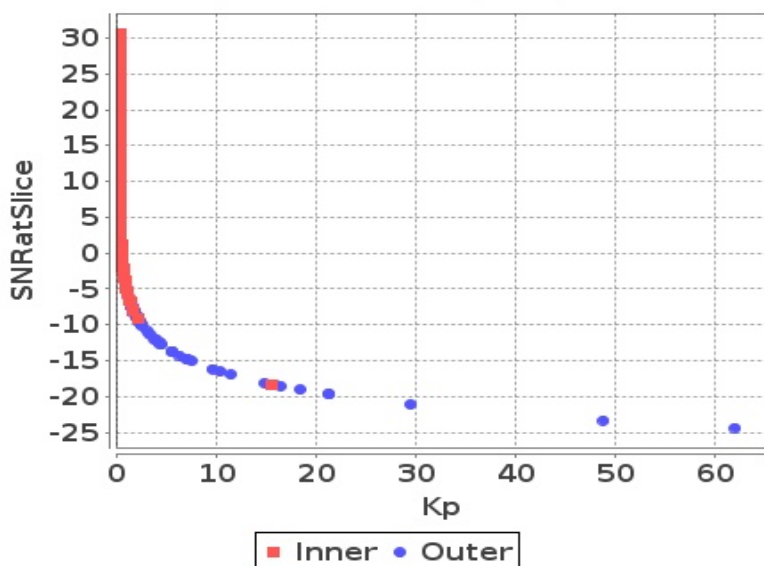
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

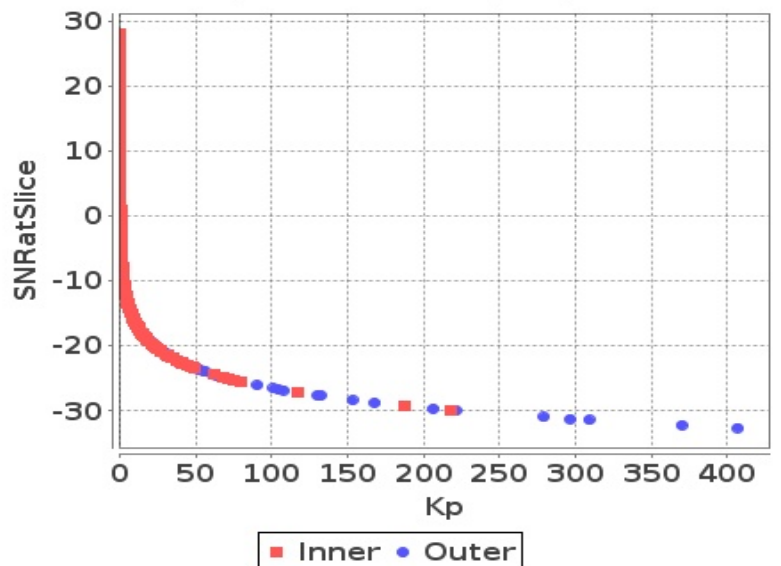
Slice

Kp Vs SNRatSlice (Land)



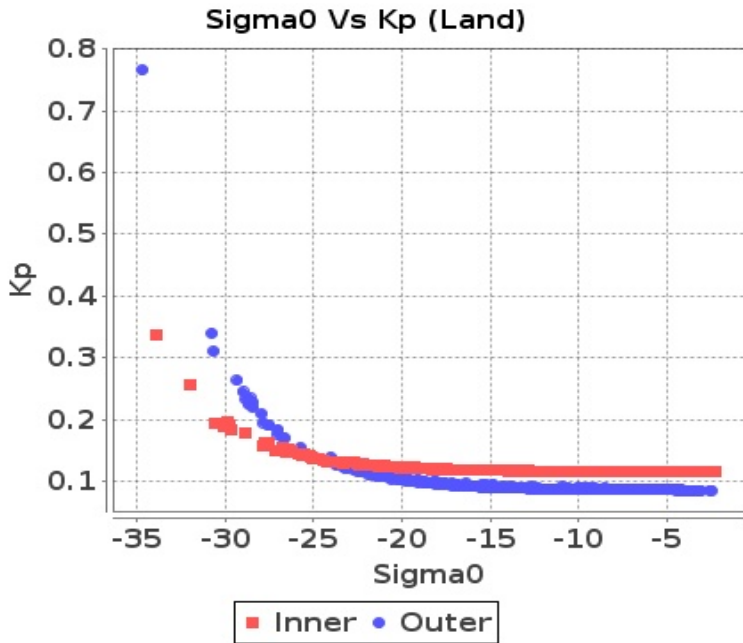
Slice

Kp Vs SNRatSlice (Sea)

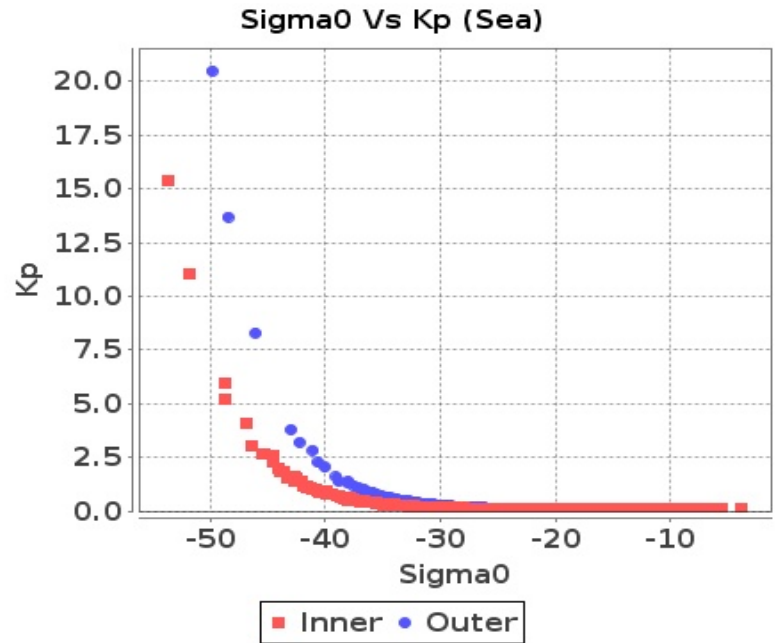


# Sigma0 Behaviour(Sigma0 Vs Kp)

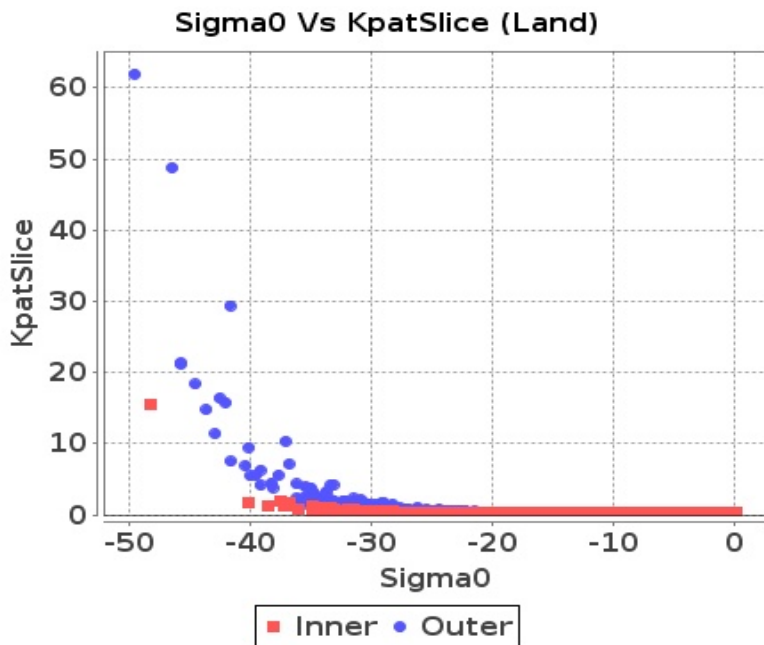
## Footprint-Land



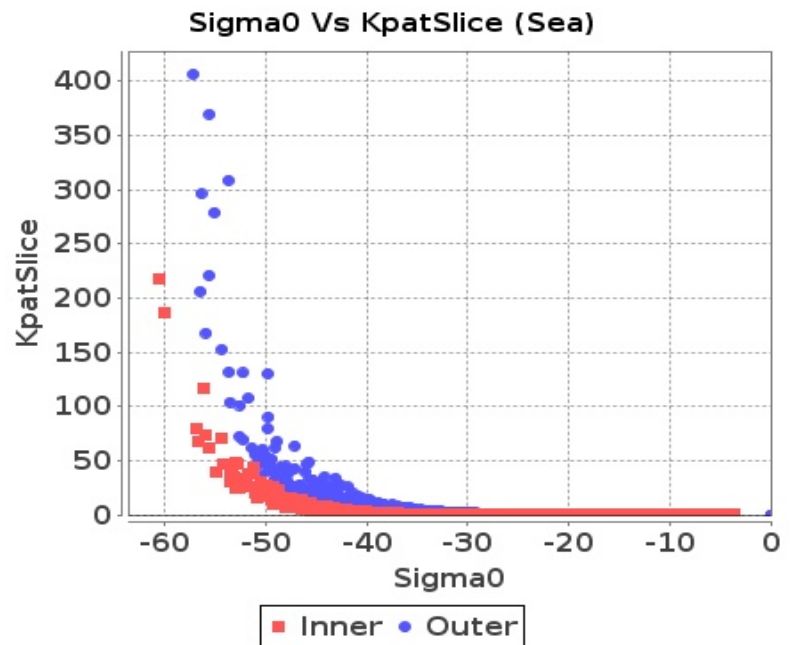
## Footprint-Sea



## Slice-Land



## Slice-Sea

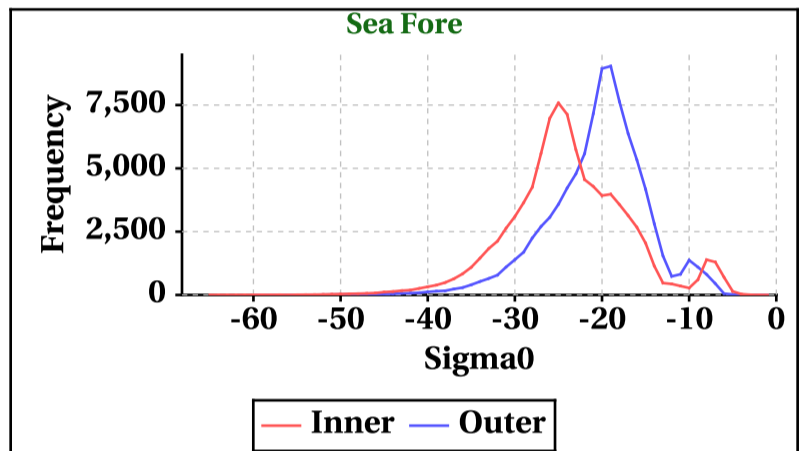
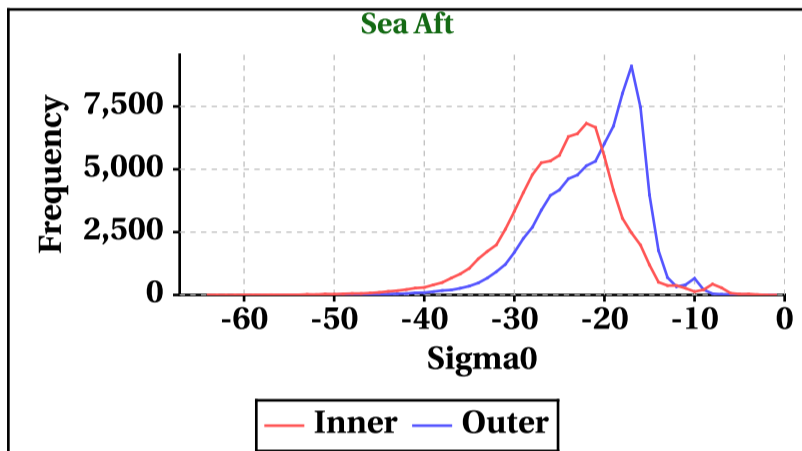
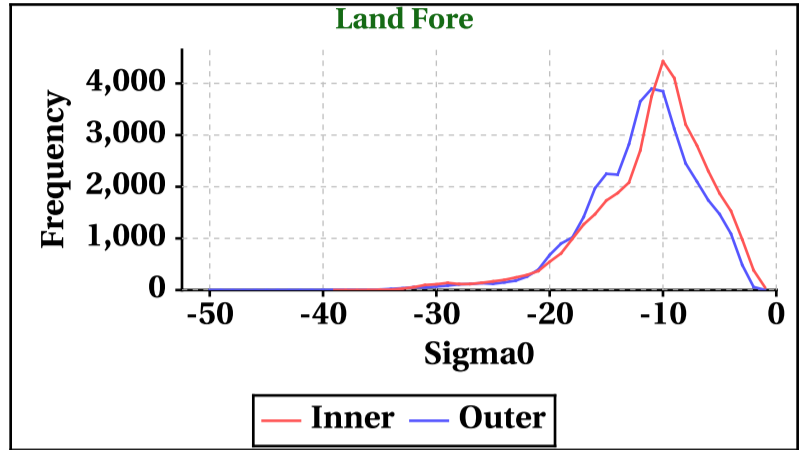
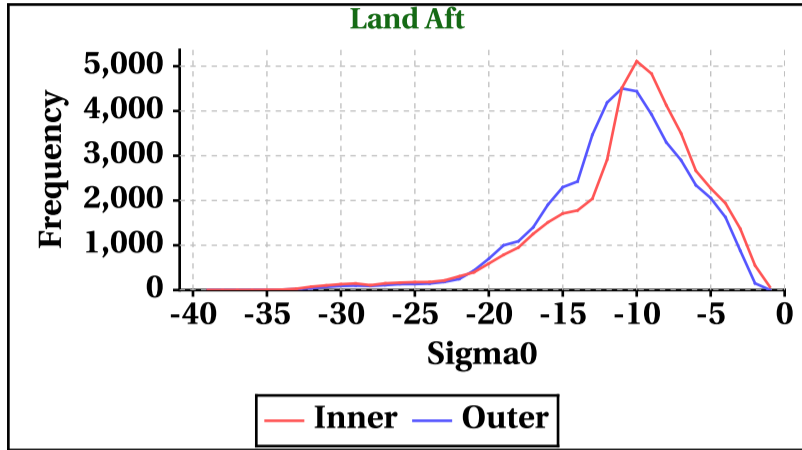


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-39	-39	-64	-65
Max	0	0	0	0

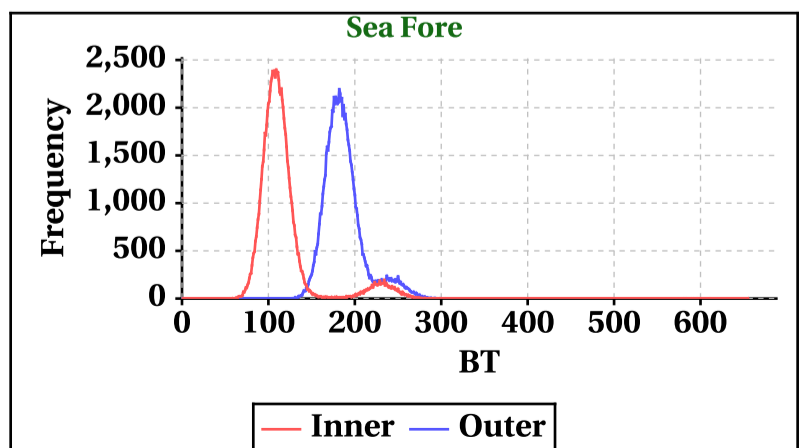
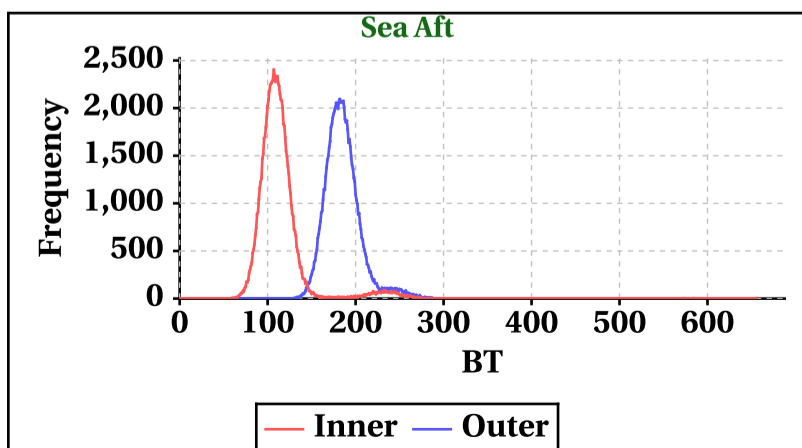
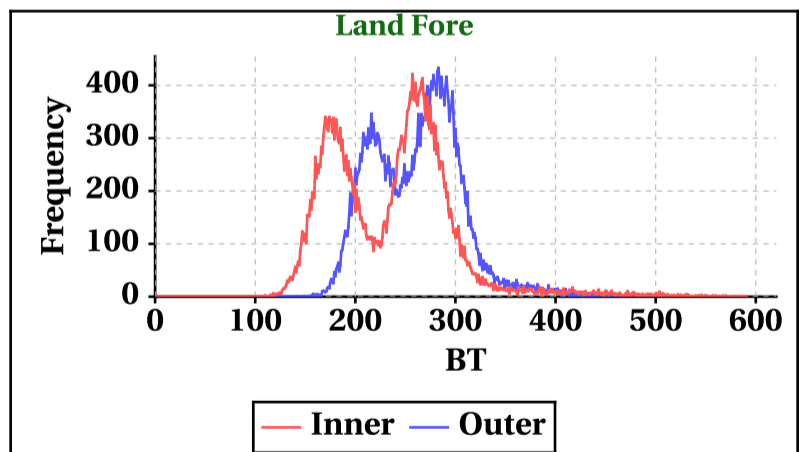
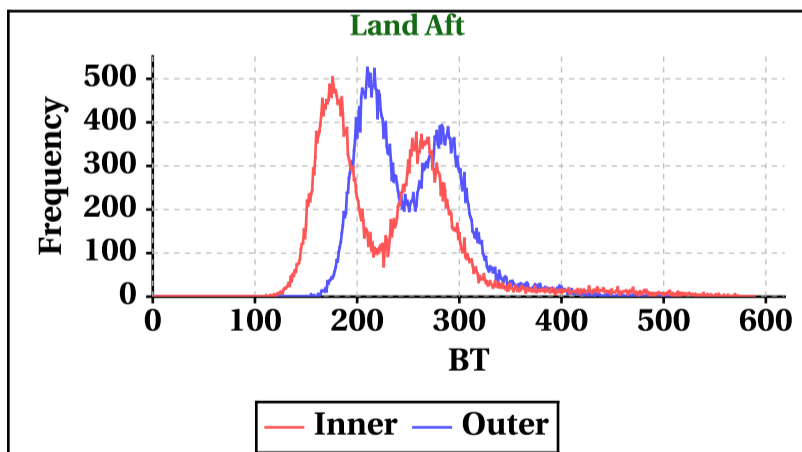
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-39	-50	-58	-60
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	589	591	655	655

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	511	505	349	377

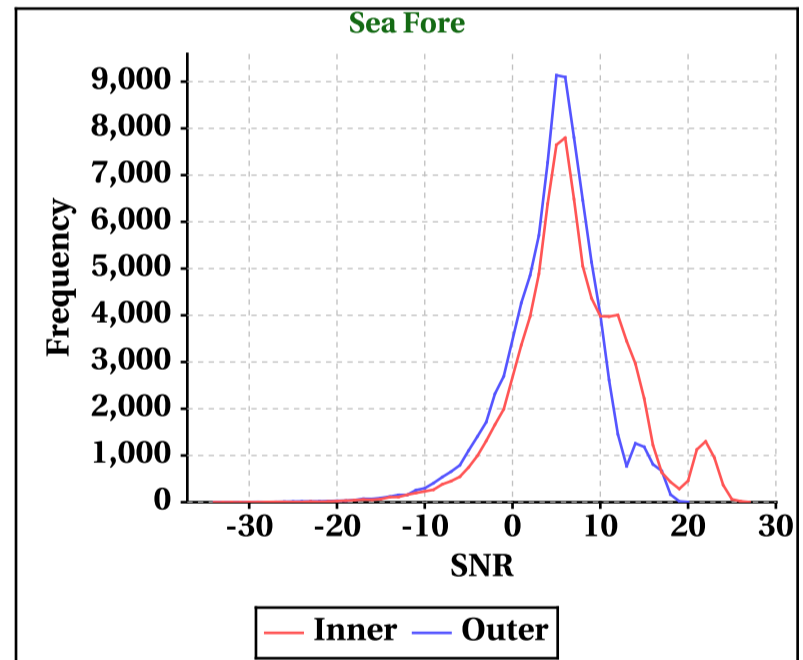
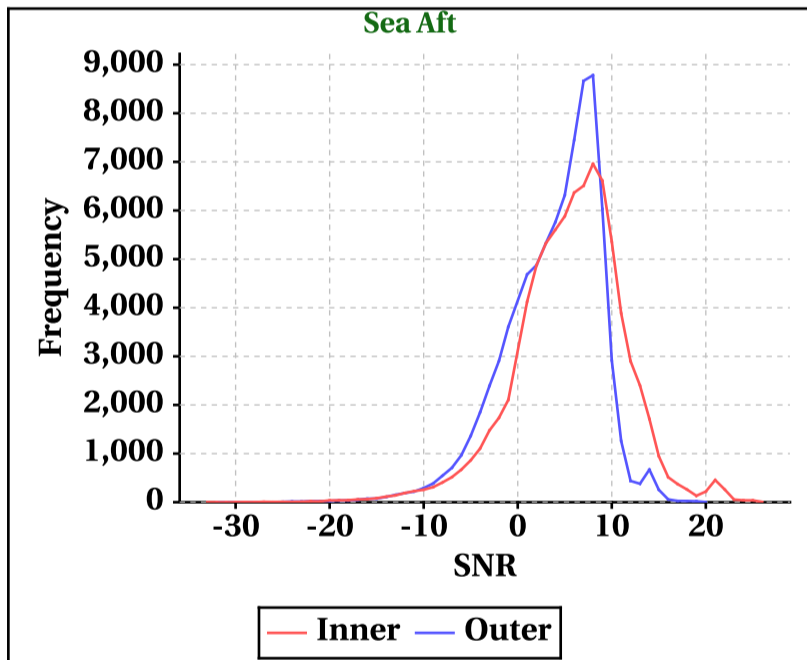
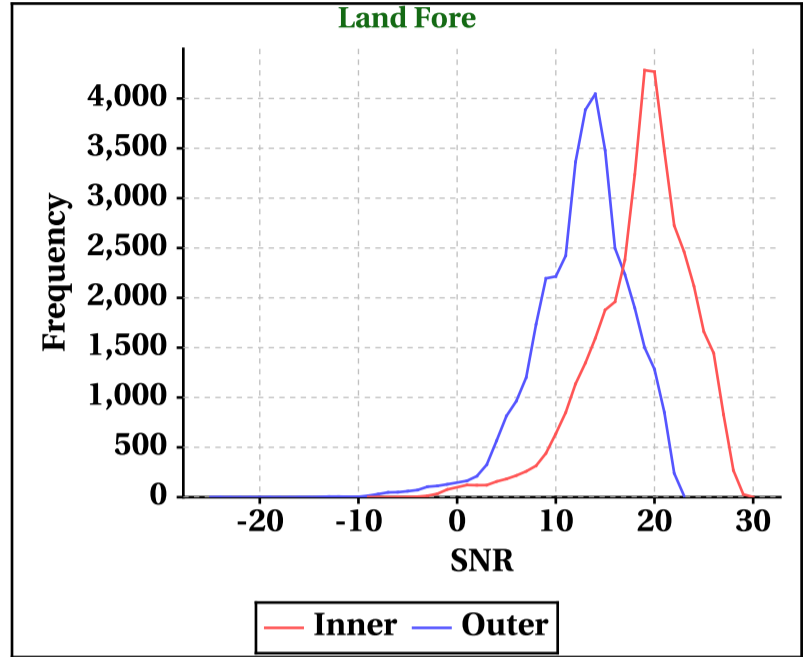
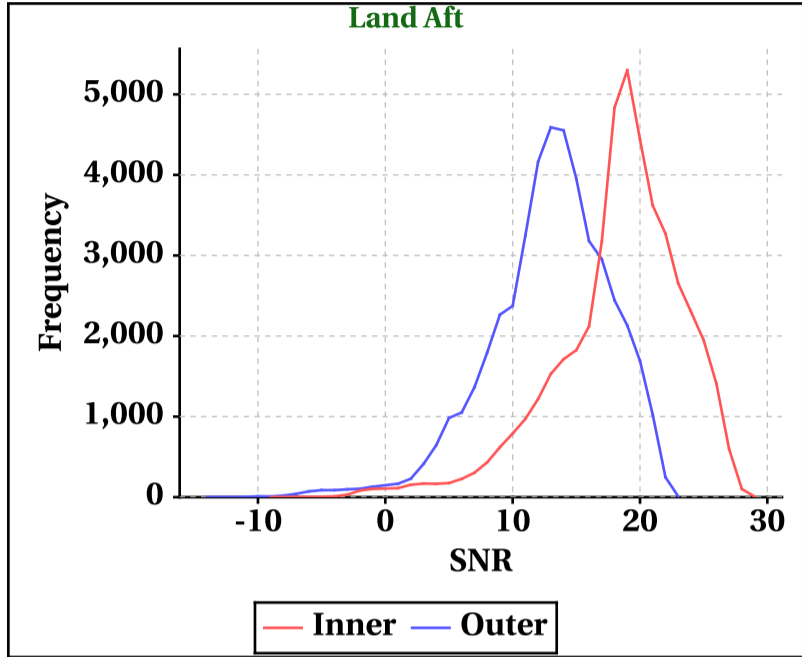


# Dynamic Range (Data Histograms)

## SNR(dBm)

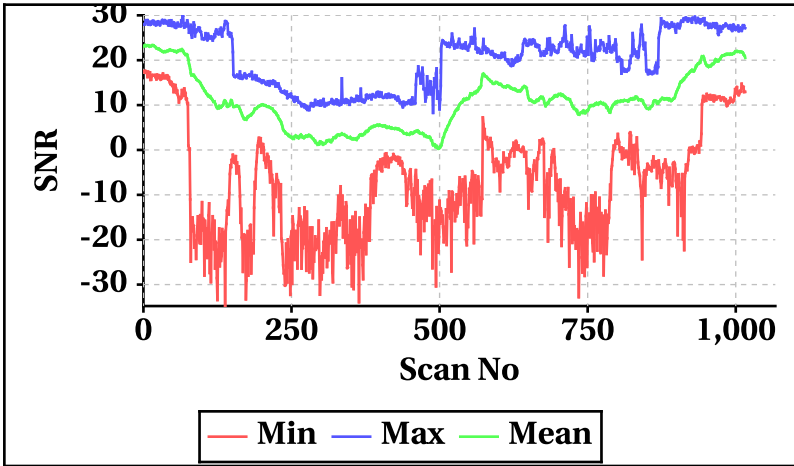
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-9	-9	-33	-34
Max	29	30	26	27

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-14	-25	-32	-34
Max	23	23	20	20

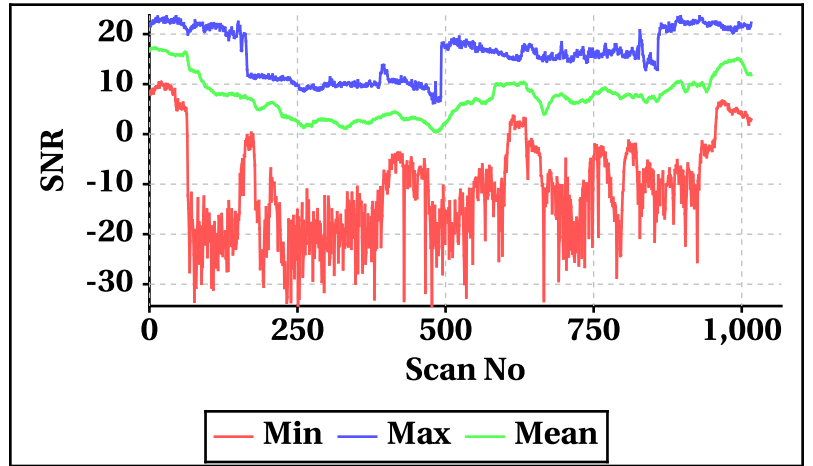


## Orbit-wise behaviour of SNR

**Inner Beam (HH)**

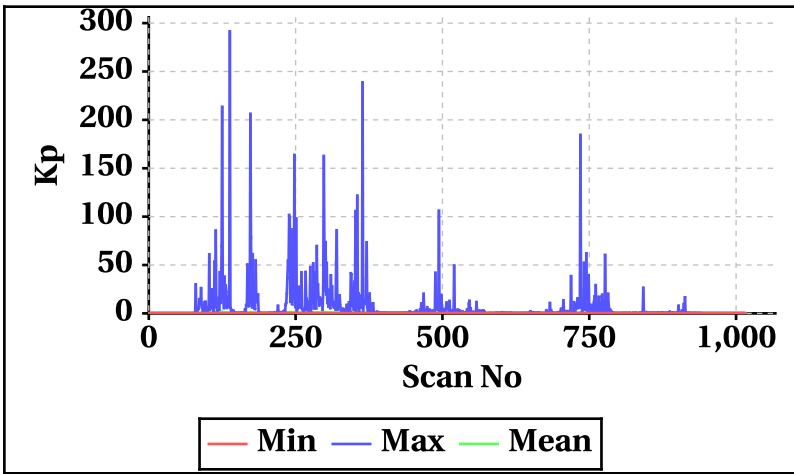


**Outer Beam(VV)**

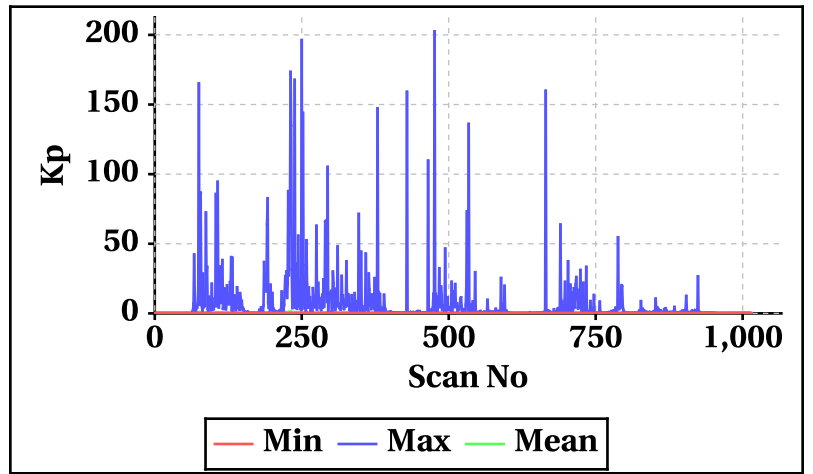


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

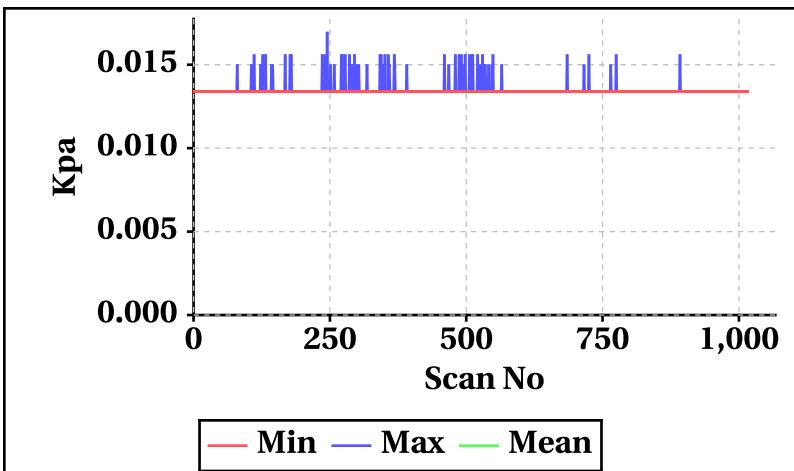
**Inner Beam(HH)**



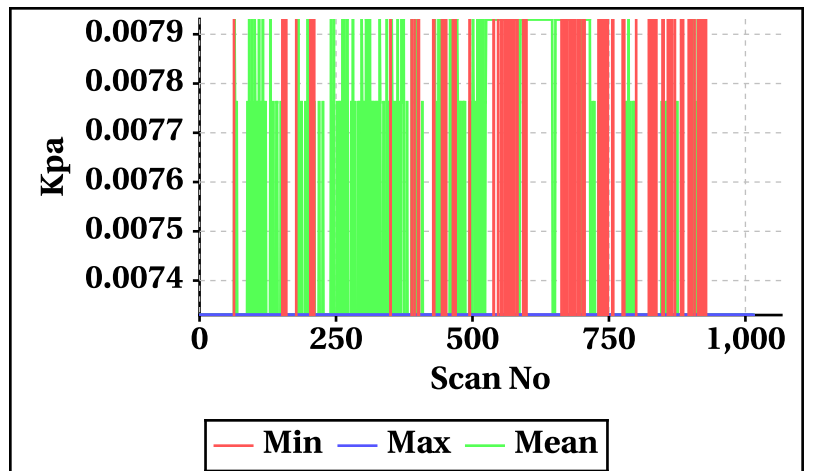
**Outer Beam(VV)**



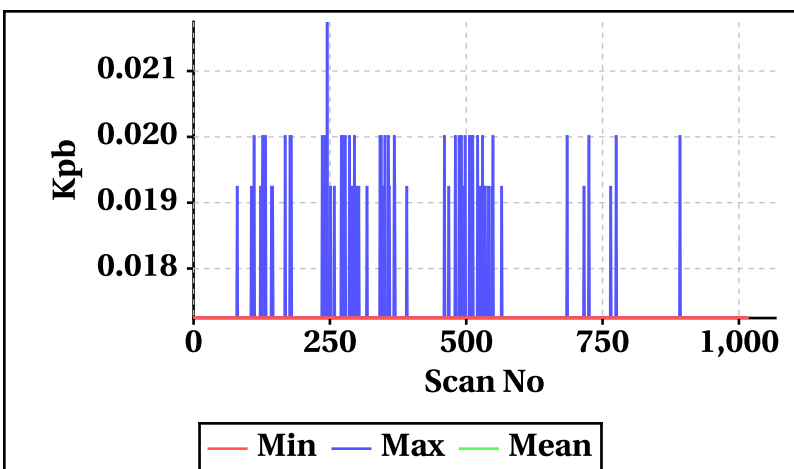
**Inner Beam(HH)**



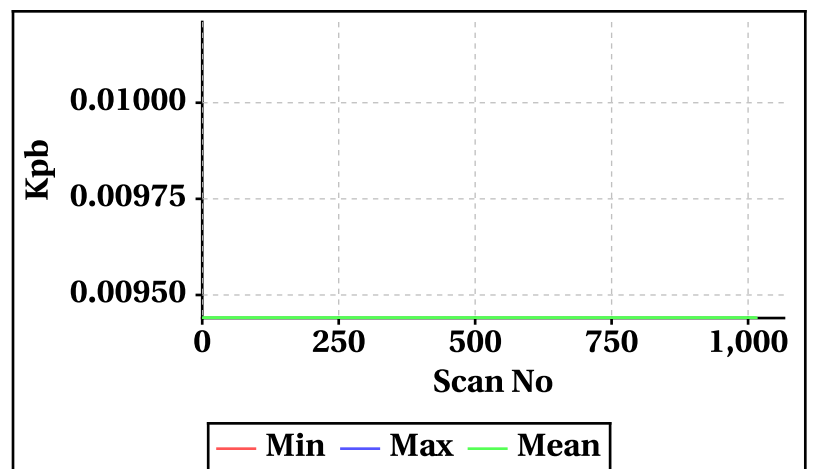
**Outer Beam(VV)**



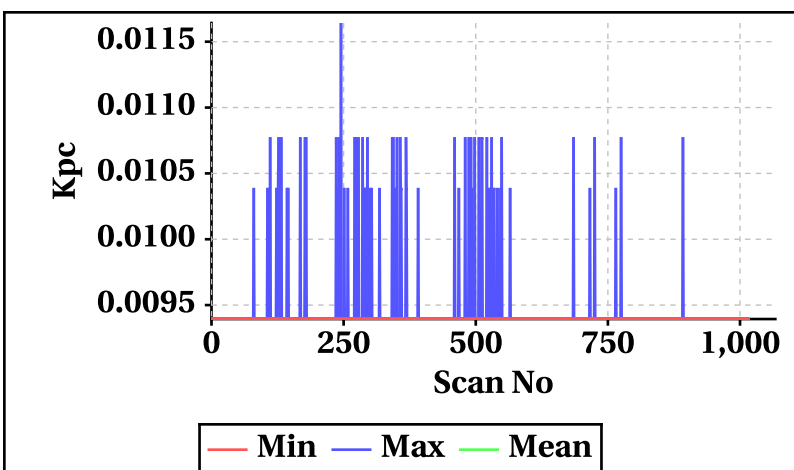
**Inner Beam(HH)**



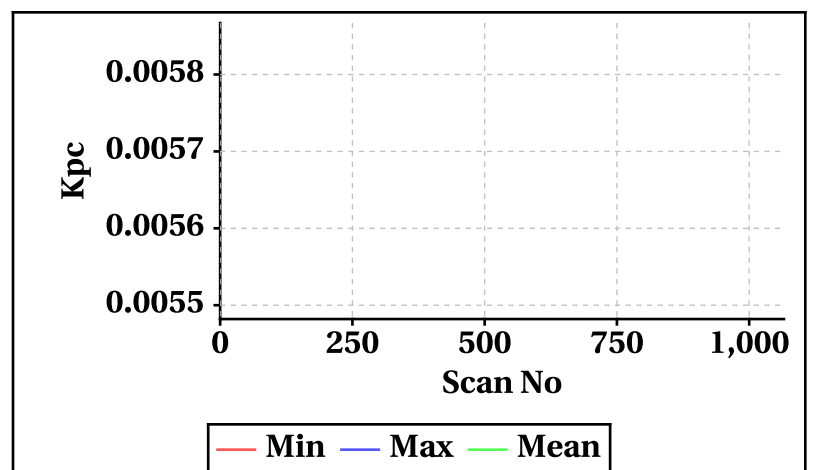
**Outer Beam(VV)**



**Inner Beam(HH)**



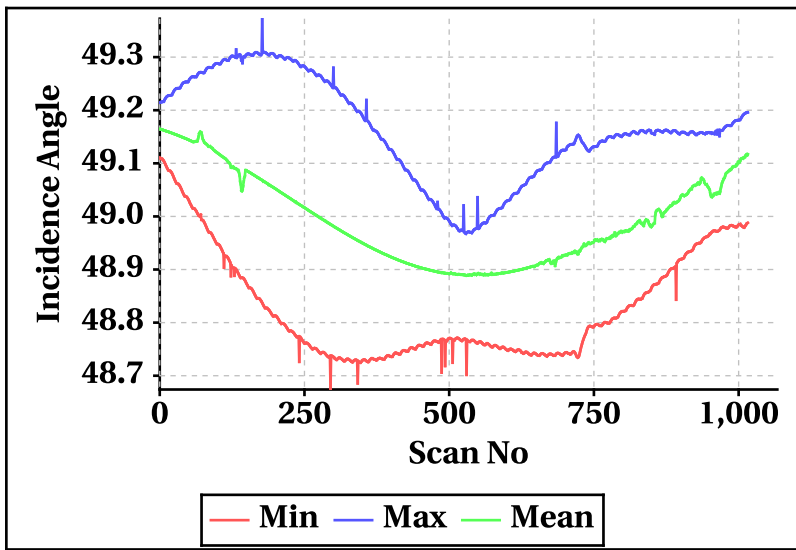
**Outer Beam(VV)**



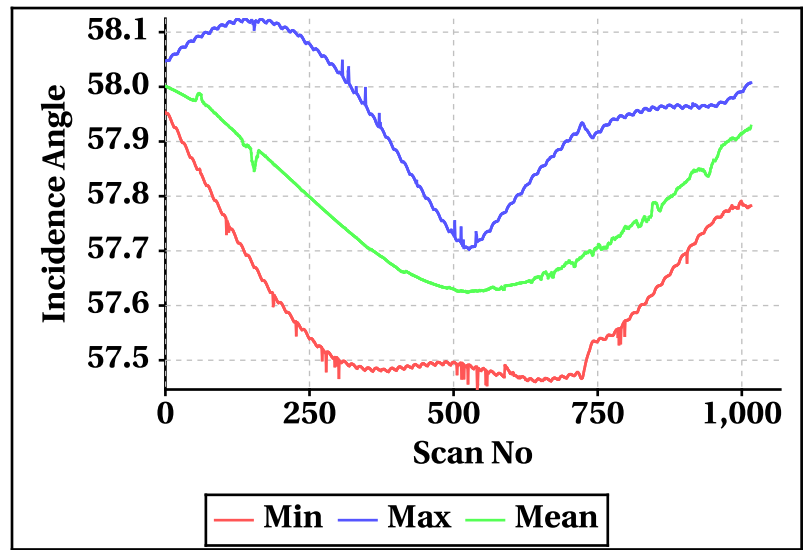


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

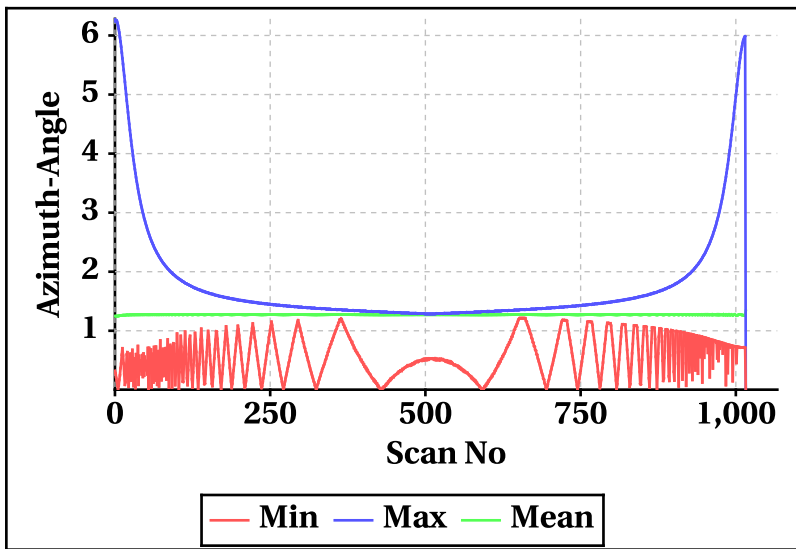
Inner Beam (HH)



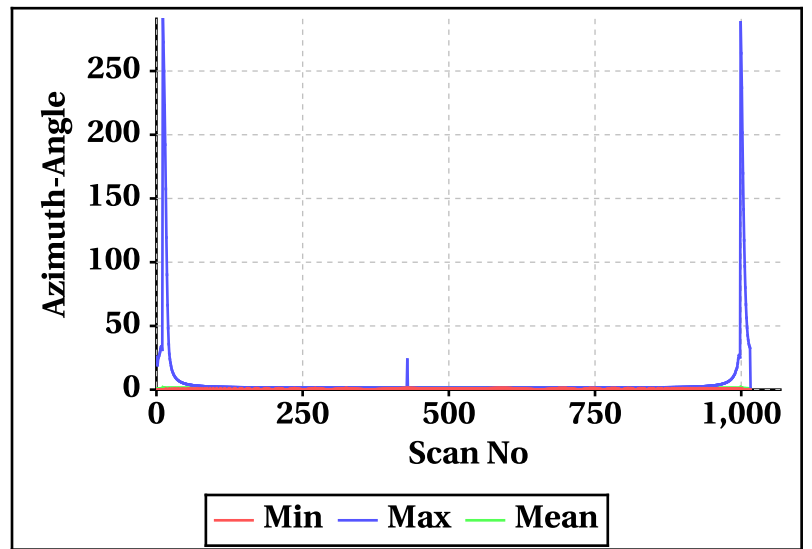
Outer Beam(VV)



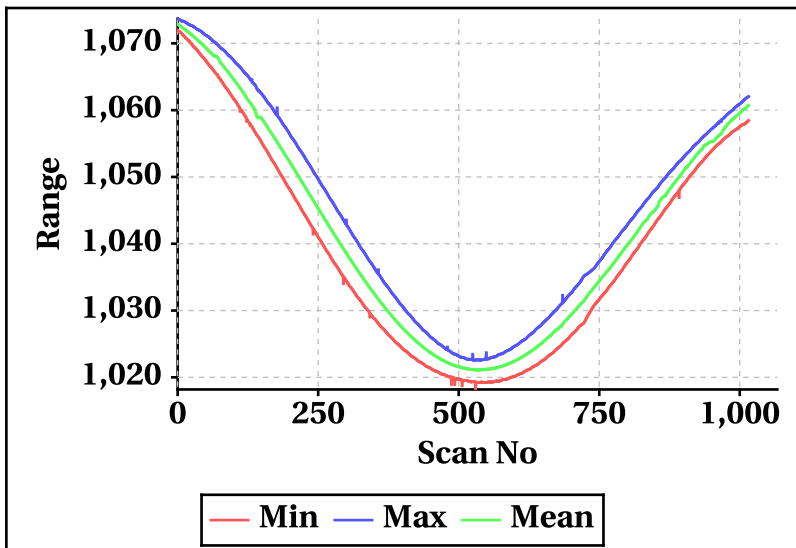
Inner Beam (HH)



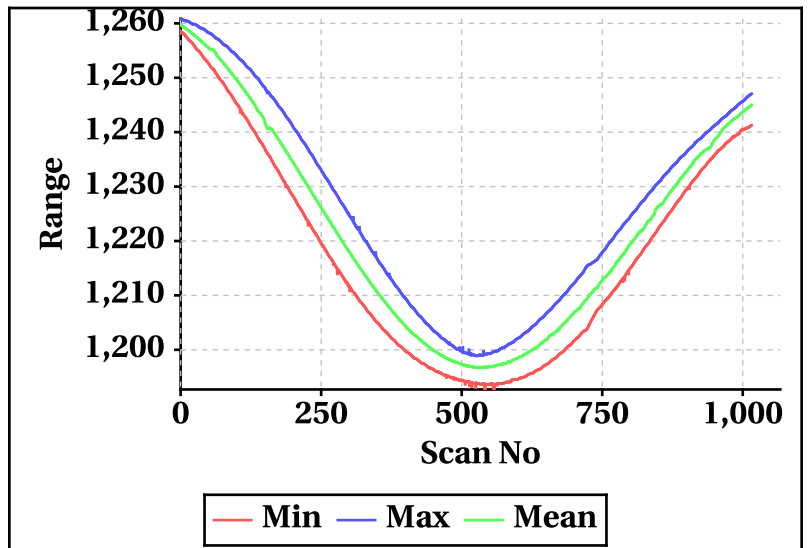
Outer Beam(VV)



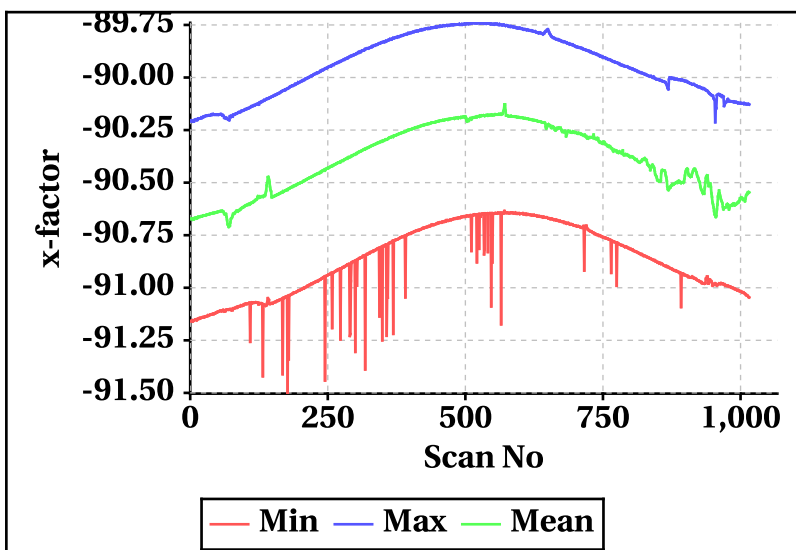
Inner Beam (HH)



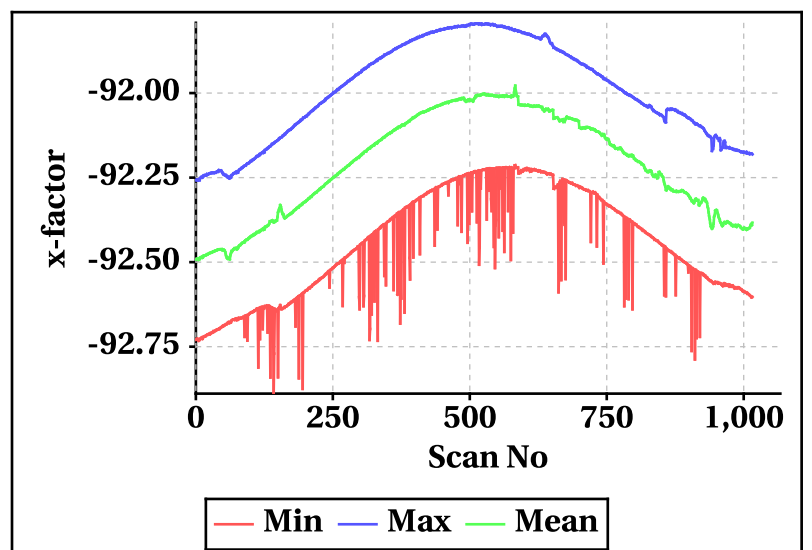
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

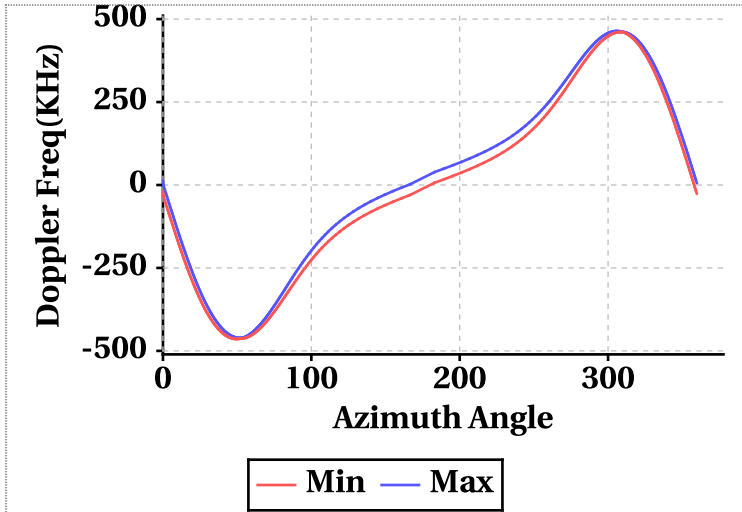


# Doppler Frequency Variation

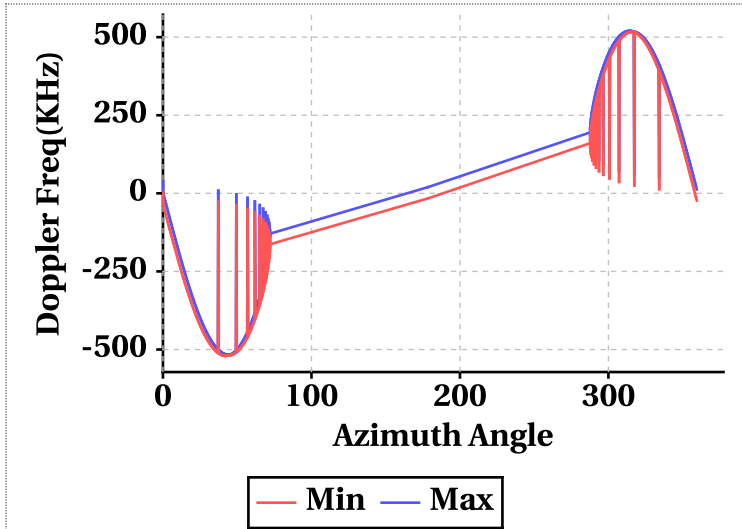
**Doppler Frequency(KHz) variation statistics Over the half Orbit**

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-464.16	-520.16
<b>Max</b>	463.98	519.98

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



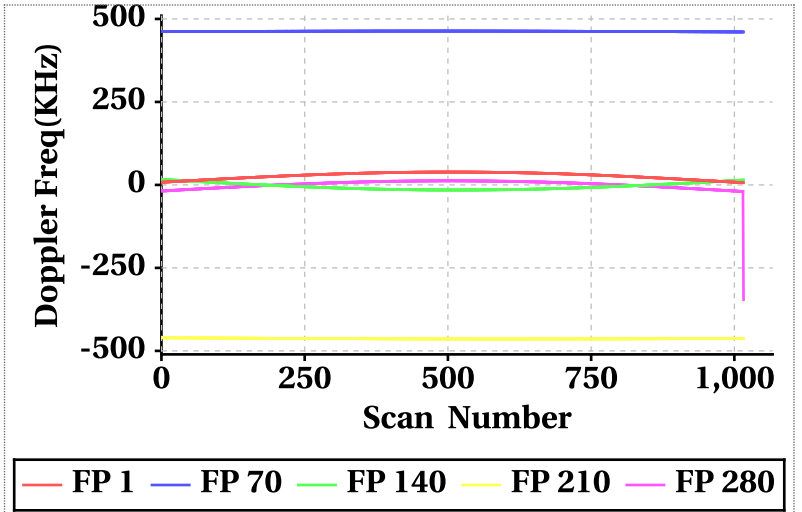
**Footprint wise Doppler frequency variation Outer Beam (VV)**



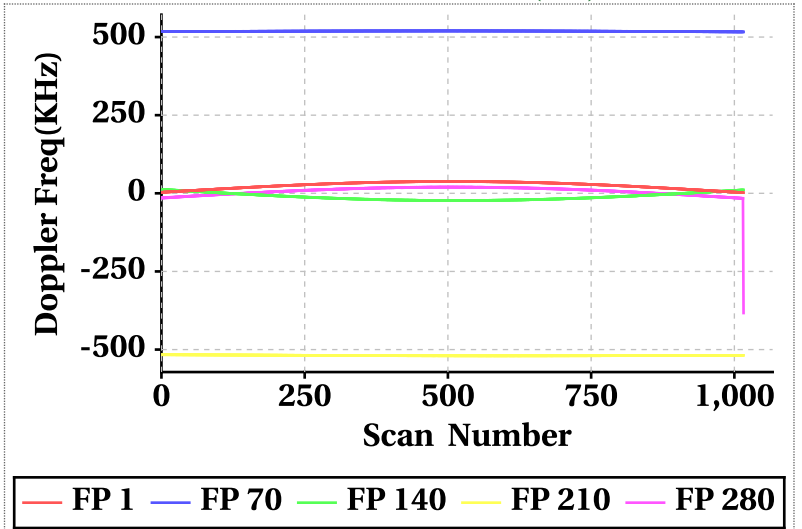
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	6.62	38.80	27.34	2.04	37.82	25.03
Doppler_70	460.78	463.48	462.64	516.56	519.66	518.63
Doppler_140	-15.42	16.60	-4.14	-23.16	12.62	-10.47
Doppler_210	-464.12	-460.46	-463.05	-519.96	-516.42	-518.92
Doppler_280	-345.60	12.50	0.57	-383.12	19.90	6.55

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

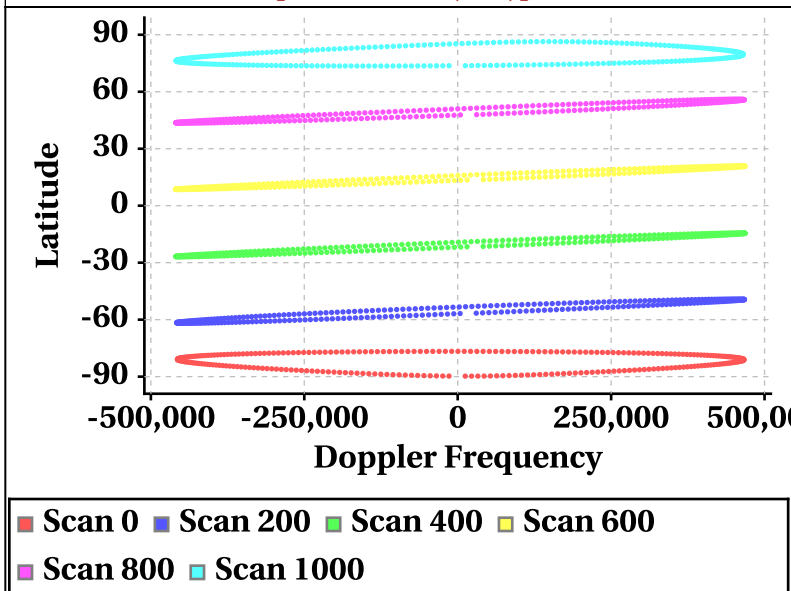


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

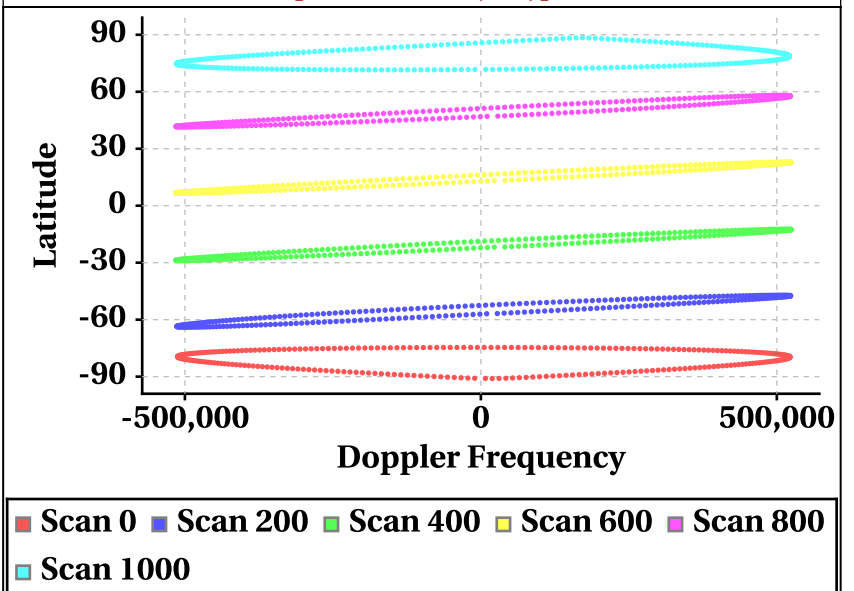


# Latitude Vs Doppler Frequency

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



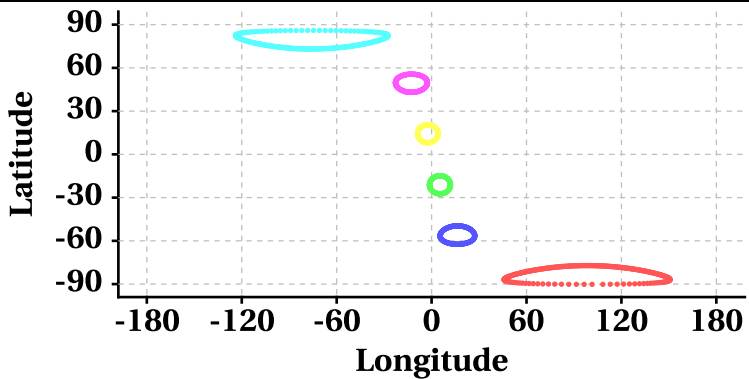
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

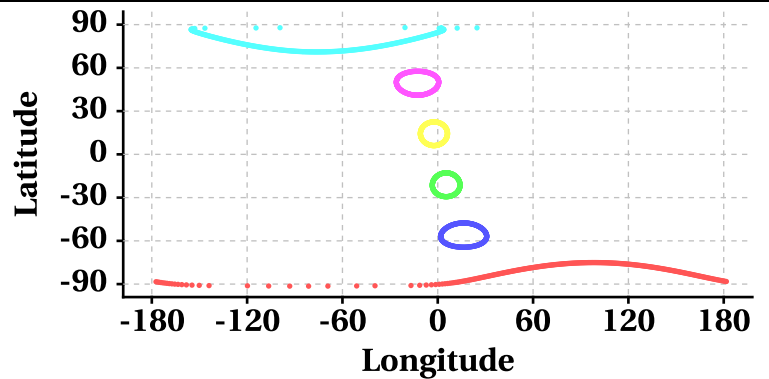
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

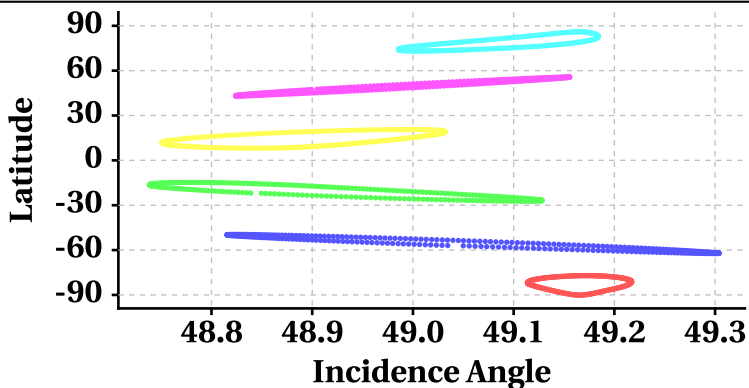
Scan Trace [Outer Beam (VV)]



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

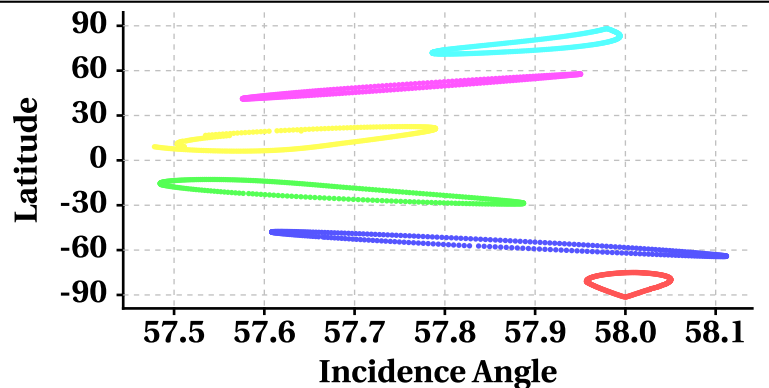
## Latitude Vs Incidence Angle

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



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

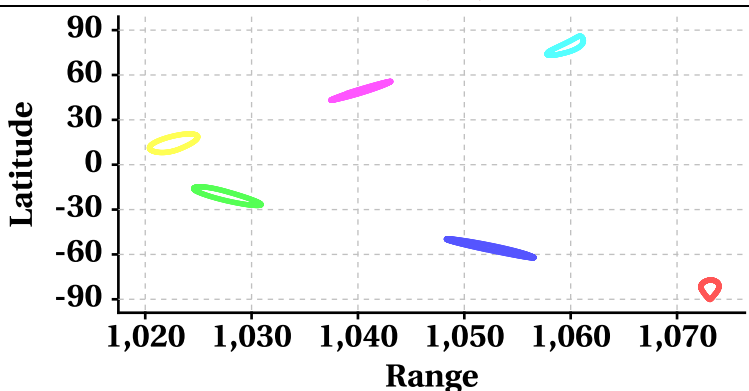
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

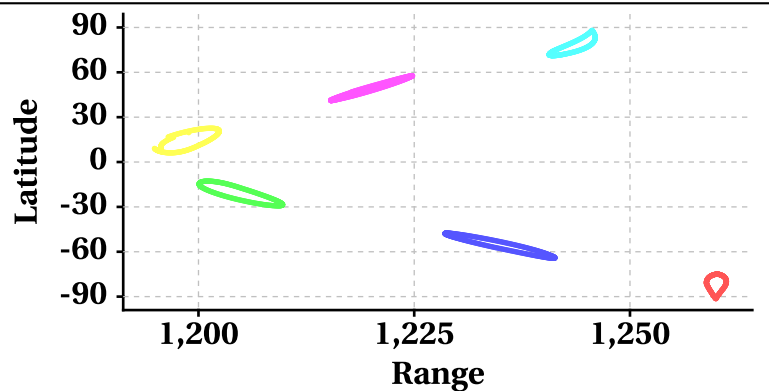
## Latitude Vs Range

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

