

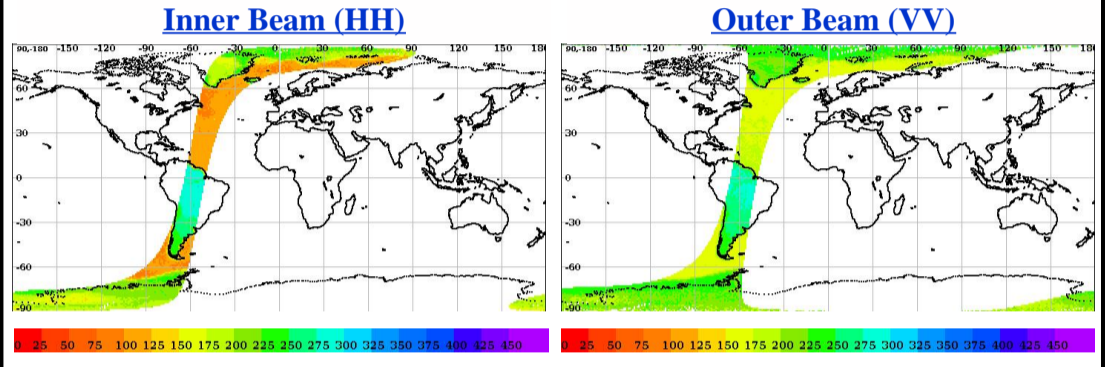
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

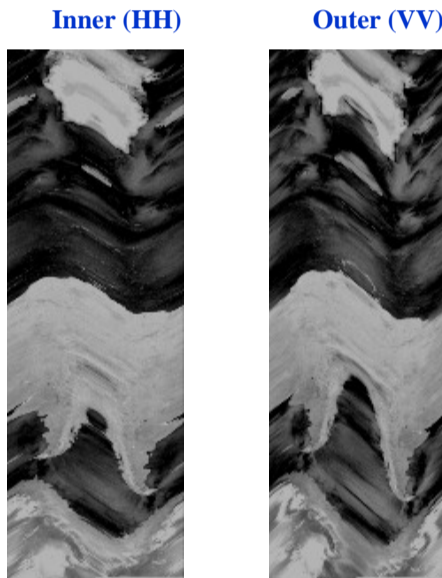
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along 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>	15374	<b>Total Scans</b>	1016
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	15375	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	15374_15375	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	22-08-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	22-08-2019	<b>Equator Crossing Time</b>	12:16:18.000	<b>No Of Outer Slices</b>	15

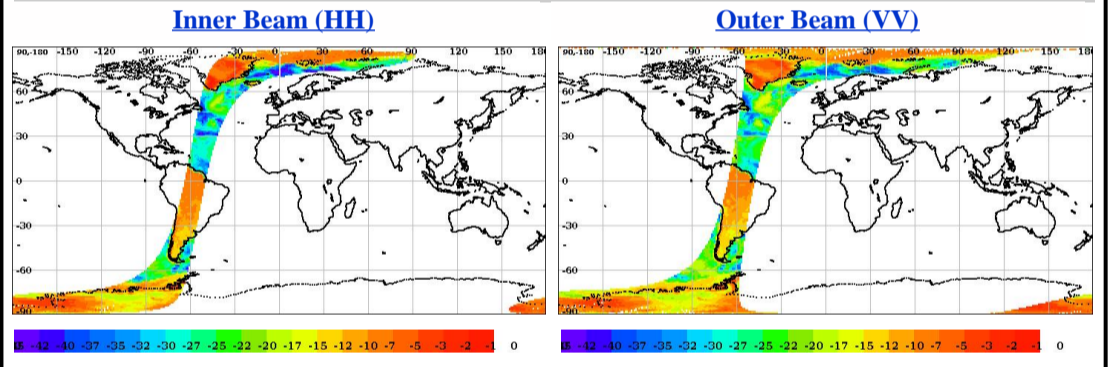
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



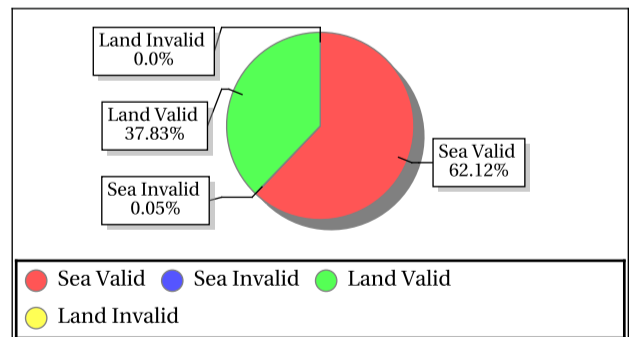
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

<b>Sigma-0 Flags</b>	<b>Inner Beam</b>	<b>Outer Beam</b>
<b>Invalid Sigma0(%)</b>	0.05	0.05
<b>Data Not Available From Payload (%)</b>	100.0	100.0
<b>Slice not within sample array limits (%)</b>	0.00	0.00
<b>C(S+N) - C(N) &lt; 0.1 (%)</b>	0.00	0.00
<b>Poor Sigma0(%)</b>	22.22	13.34
<b>Noise samples for blending Saturated</b>	0.0	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>	0.054476	0.126983

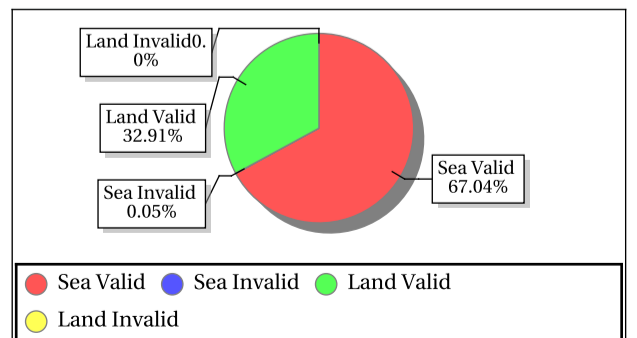
\*DP Format Document

## 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	-6.59	-4.35	-5.08	0.66	157.52	195.89	168.54	9.43
GreenLand_2	77.50	-41.50	Inner	DSC	Fore	-5.46	-4.18	-4.96	0.39	151.30	211.60	177.04	15.40
GreenLand_3	71.55	-42.45	Inner	DSC	Aft	-11.16	-7.67	-8.65	0.88	150.59	219.18	192.61	15.49
GreenLand_3	71.55	-42.45	Inner	DSC	Fore	-9.76	-6.23	-8.33	0.80	162.31	222.96	185.98	14.86
Amazon_3	-6.00	-61.00	Inner	DSC	Aft	-9.49	-6.71	-8.01	0.59	264.20	343.85	294.27	17.68
Amazon_3	-6.00	-61.00	Inner	DSC	Fore	-9.41	-6.90	-8.04	0.60	247.09	337.20	285.45	18.78
GreenLand_1	74.69	-42.50	Inner	DSC	Aft	-9.74	-7.43	-8.54	0.68	155.23	207.55	180.63	12.88
GreenLand_1	74.69	-42.50	Inner	DSC	Fore	-9.54	-7.83	-8.71	0.46	165.85	196.90	180.21	9.45
Amazon_2	-3.00	-61.00	Inner	DSC	Aft	-12.39	-6.28	-8.53	1.16	203.04	300.67	260.89	24.75
Amazon_2	-3.00	-61.00	Inner	DSC	Fore	-10.51	-6.70	-8.51	1.04	230.44	339.32	270.83	21.11
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-5.95	-4.99	-5.45	0.34	190.11	233.06	217.50	15.30
GreenLand_2	77.50	-41.50	Outer	DSC	Fore	-6.13	-4.55	-5.31	0.53	200.19	246.08	229.11	17.11
GreenLand_3	71.55	-42.45	Outer	DSC	Aft	-11.94	-10.17	-10.88	0.56	194.77	260.05	219.78	17.36
GreenLand_3	71.55	-42.45	Outer	DSC	Fore	-11.12	-10.09	-10.73	0.33	213.31	263.04	231.65	14.54
Amazon_3	-6.00	-61.00	Outer	DSC	Aft	-10.27	-8.21	-9.32	0.45	239.02	305.45	275.21	16.38
Amazon_3	-6.00	-61.00	Outer	DSC	Fore	-10.00	-8.50	-9.27	0.39	232.21	319.22	275.54	19.33
GreenLand_1	74.69	-42.50	Outer	DSC	Aft	-9.67	-7.27	-8.63	0.66	204.73	249.69	218.63	13.25
GreenLand_1	74.69	-42.50	Outer	DSC	Fore	-9.78	-8.09	-8.93	0.49	214.29	250.53	229.67	11.09
Amazon_2	-3.00	-61.00	Outer	DSC	Aft	-11.78	-8.56	-10.00	0.92	234.89	298.79	261.46	15.86
Amazon_2	-3.00	-61.00	Outer	DSC	Fore	-11.82	-8.61	-9.56	0.76	213.29	308.20	269.74	18.69



## 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	300.52	0.51	5.238	0.12	291.68	0.45	4.629	0.12	0.76	0.12	0.000	0.12	0.41	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>	-34.91	24.11	3.03	0.452	-34.78	24.38	2.04	0.083	-8.35	29.59	19.01	13.215	-5.17	30.32	19.75	22.314

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	225.11	0.43	4.953	0.09	219.39	0.42	4.651	0.09	0.81	0.09	0.000	0.09	0.43	0.09	0.000
<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>	-34.83	17.48	0.92	0.000	-34.71	19.51	0.02	0.000	-10.04	22.25	13.54	0.014	-6.89	23.61	13.95	0.247

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>	48.62	49.35	48.99	0.000	57.40	58.18	57.86	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0026	264.59	1.27	2.595	0.0000	298.82	1.27	3.757	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1028.93	1085.69	1050.76	0.000	1205.59	1275.84	1233.52	7.129	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.77	-89.97	-90.58	0.000	-93.25	-92.02	-92.18	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	16.00	16.52	16.10	0.000	21.06	22.86	21.20	2.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.74	589.25	20.81	2.000	18.36	773.17	21.08	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

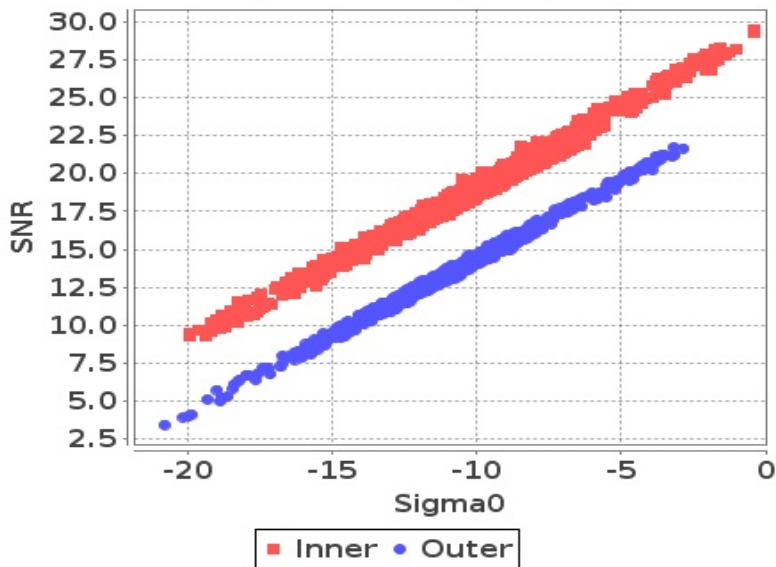
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

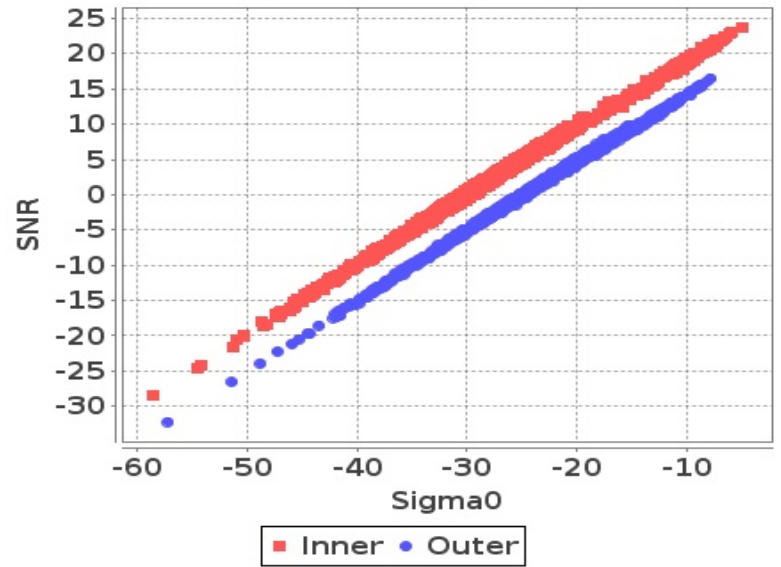
Footprint-Land

Sigma0 Vs SNR (Land)



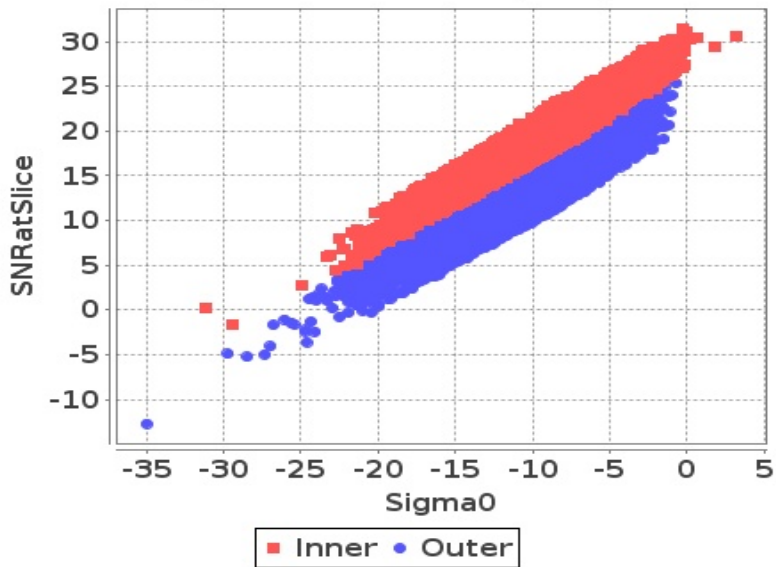
Footprint-Sea

Sigma0 Vs SNR (Sea)



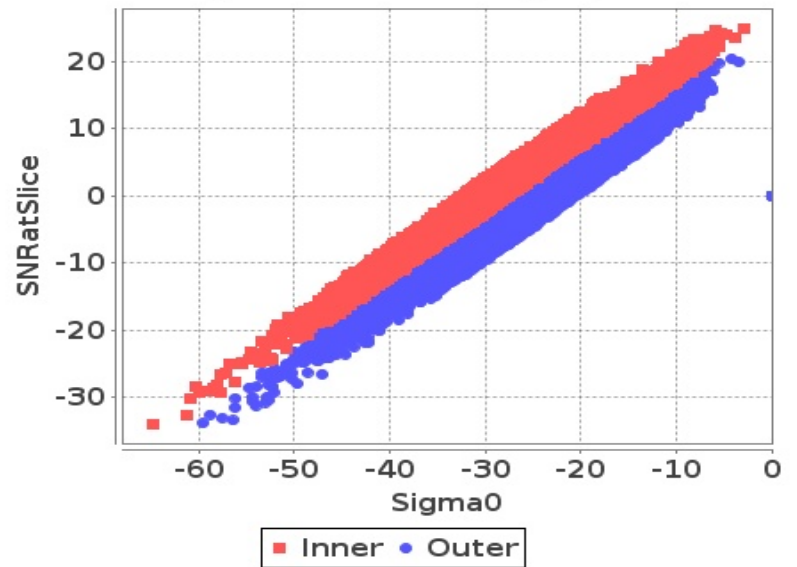
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

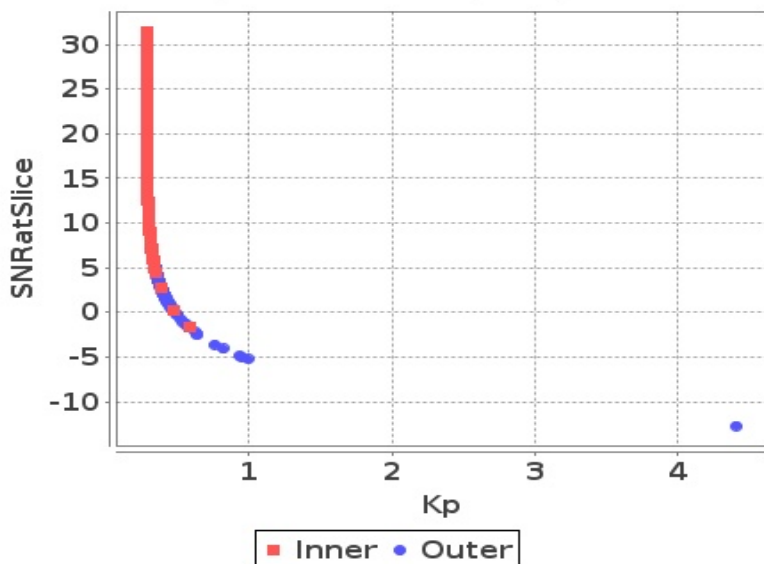
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

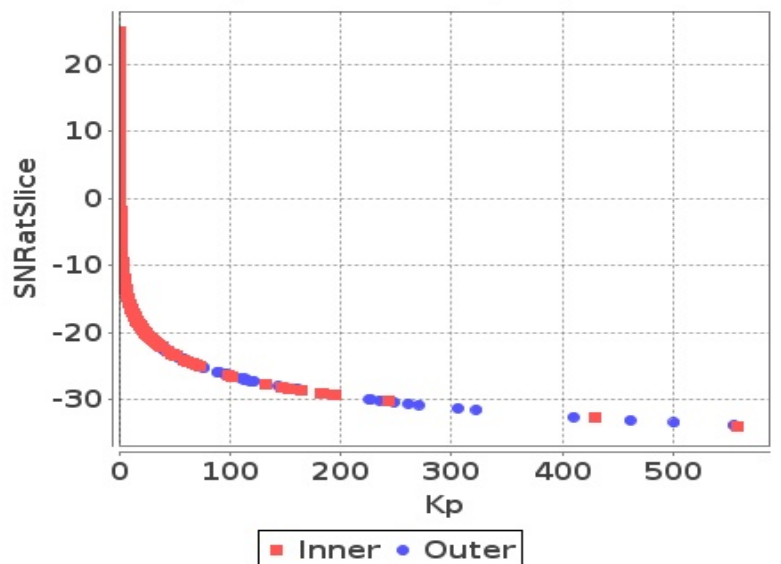
Slice

Kp Vs SNRatSlice (Land)



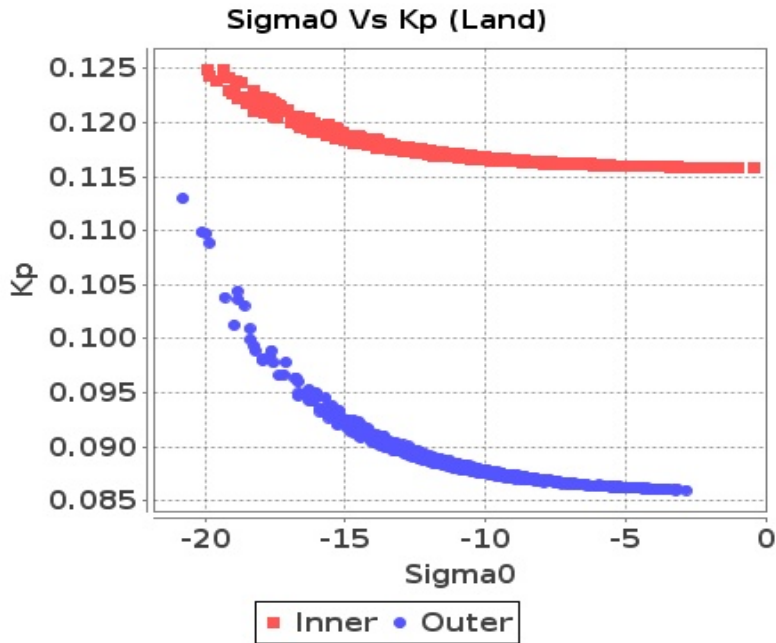
Slice

Kp Vs SNRatSlice (Sea)

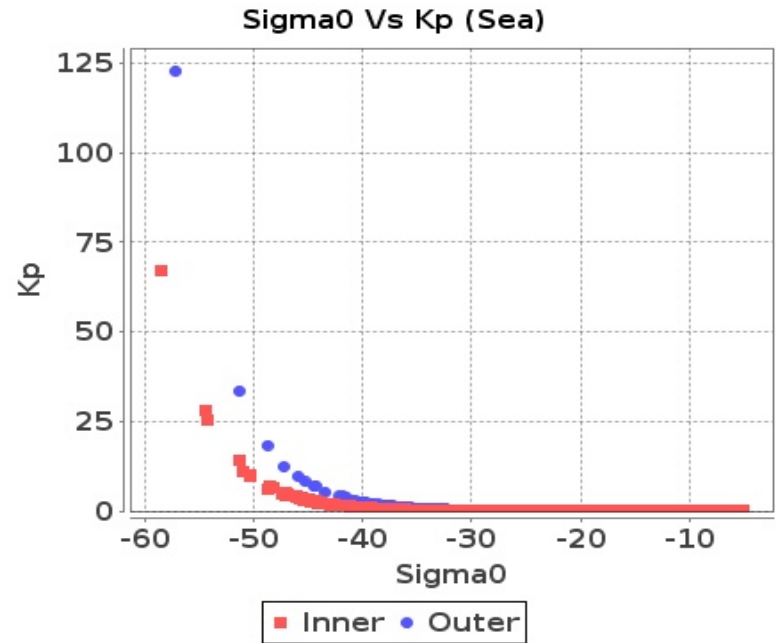


# Sigma0 Behaviour(Sigma0 Vs Kp)

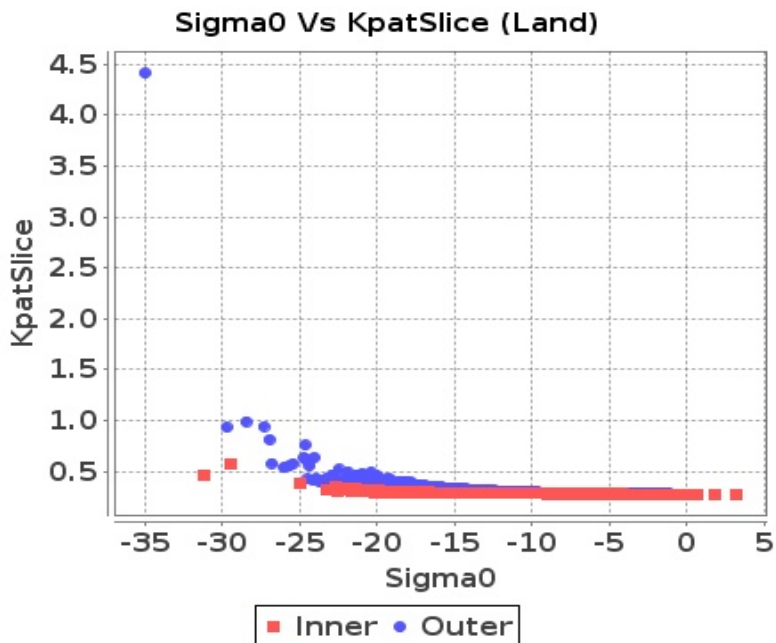
## Footprint-Land



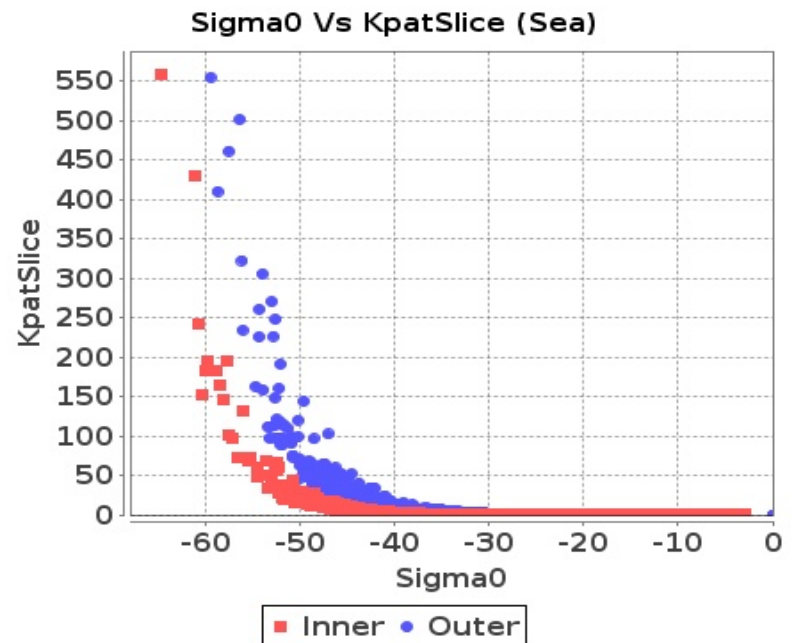
## Footprint-Sea



## Slice-Land



## Slice-Sea

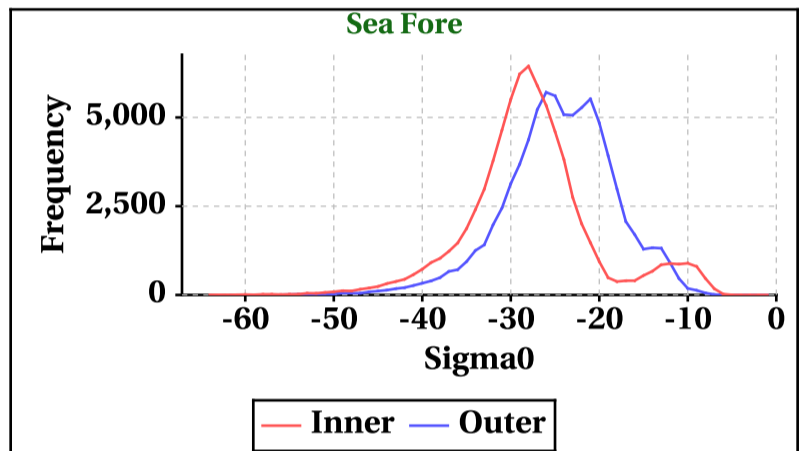
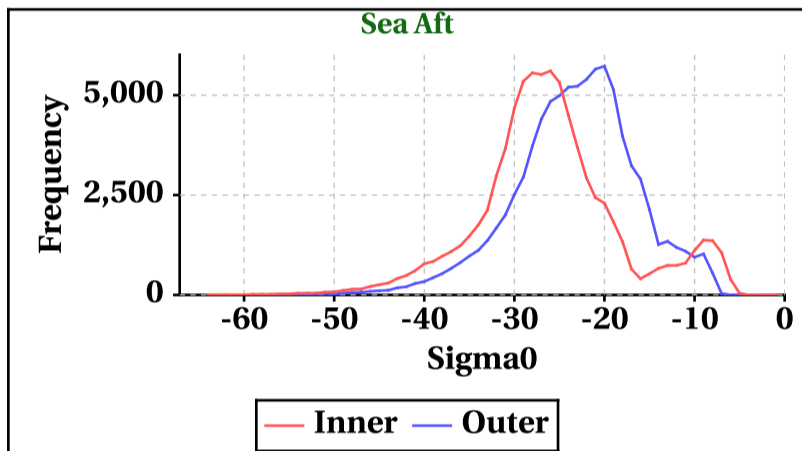
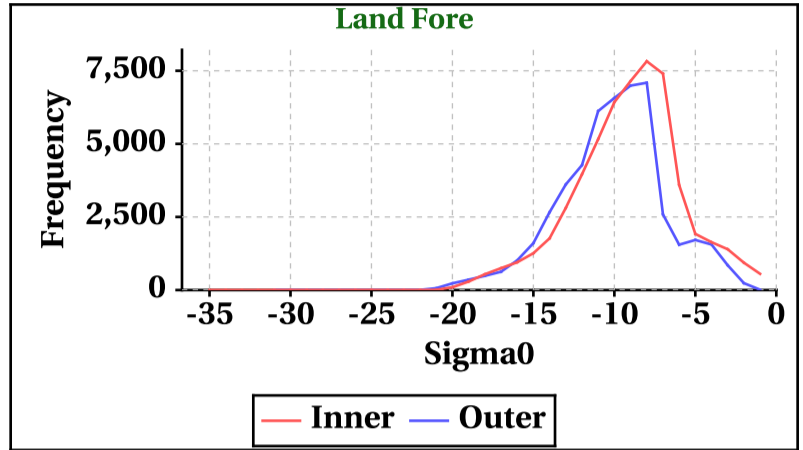
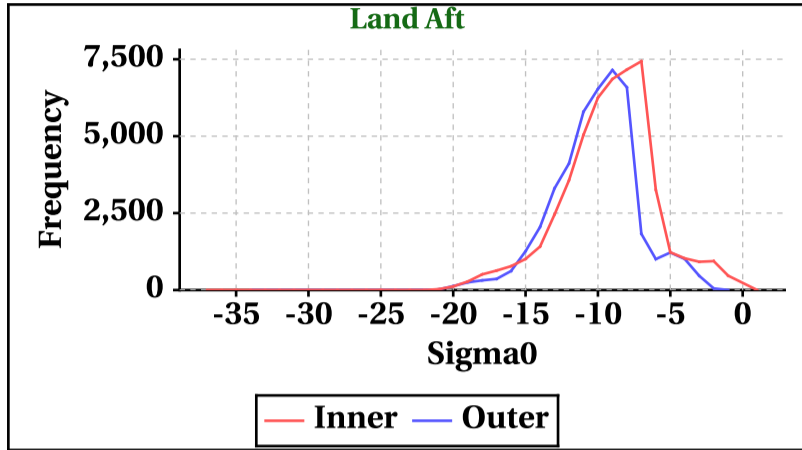


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-37	-35	-64	-64
Max	1	0	0	0

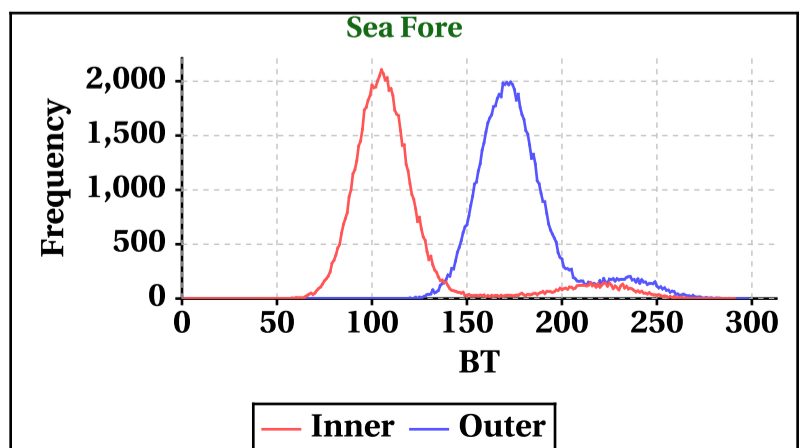
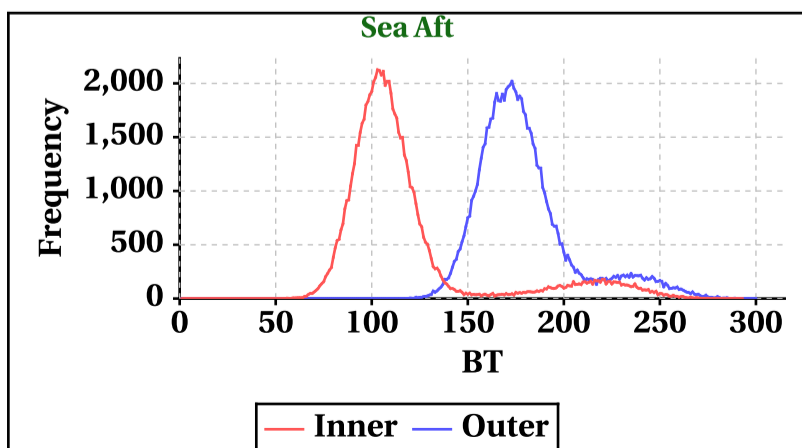
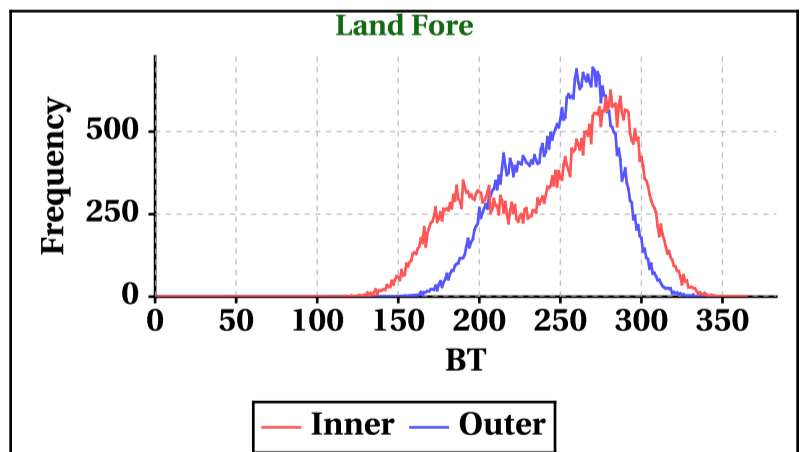
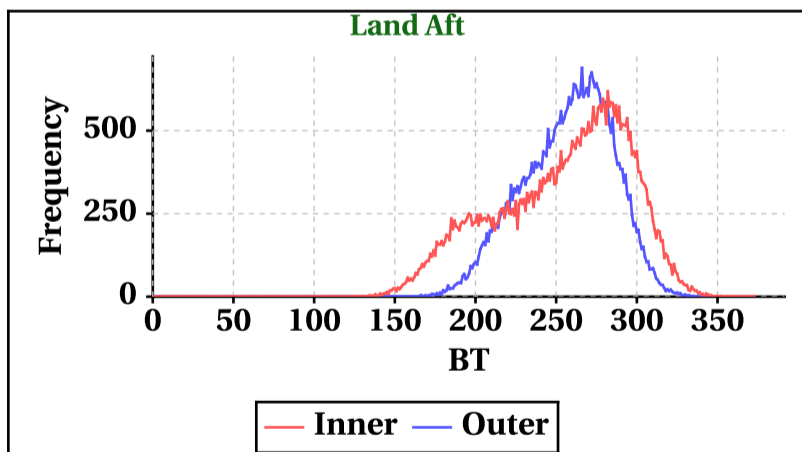
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-34	-31	-59	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	373	365	293	291

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	346	347	300	298

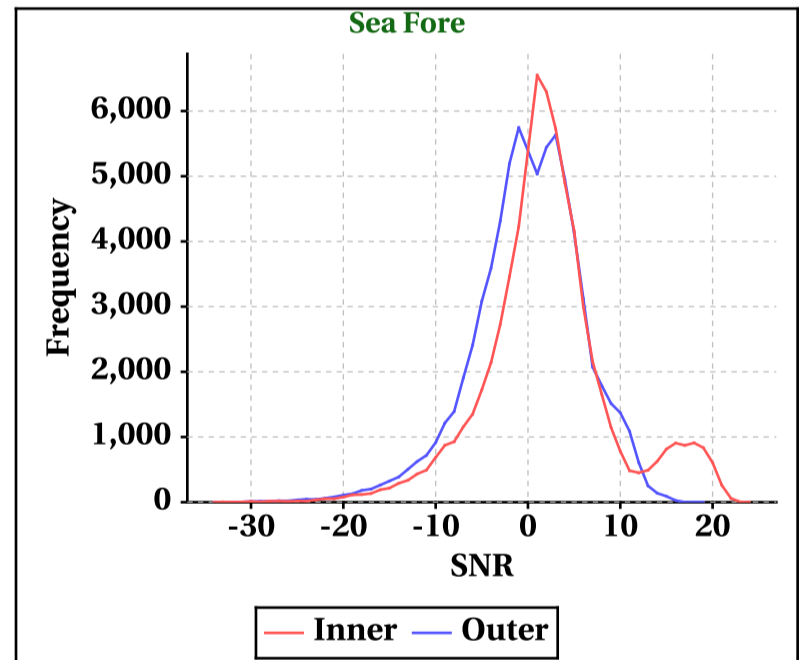
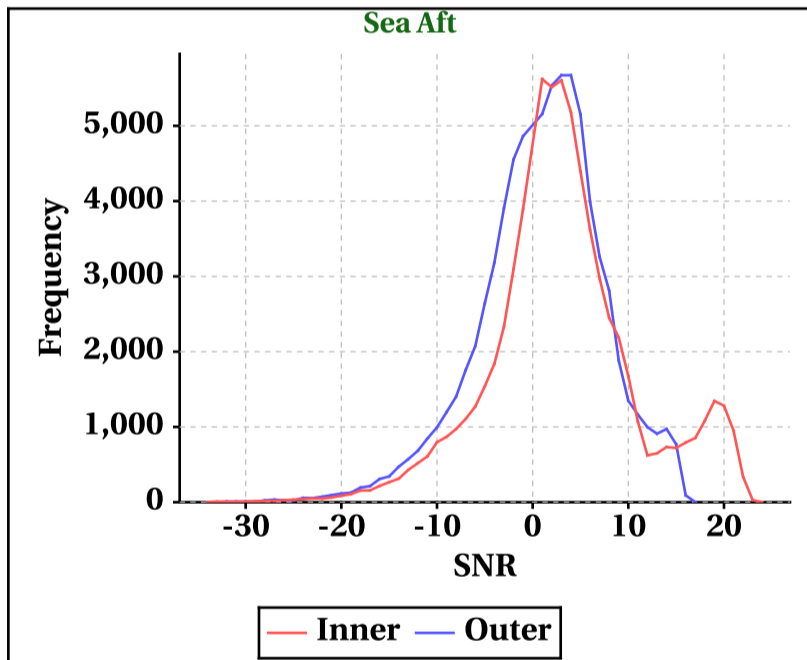
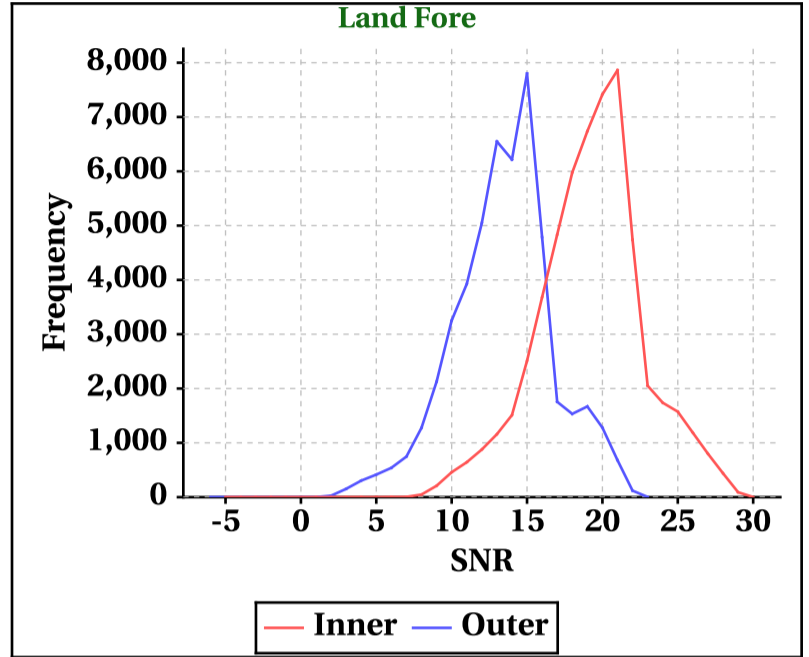
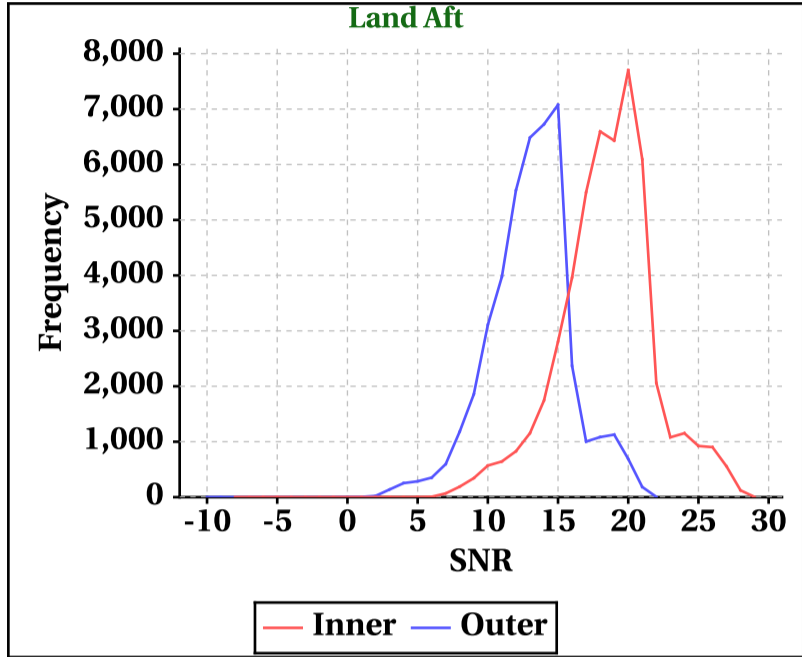


# Dynamic Range (Data Histograms)

## SNR(dBm)

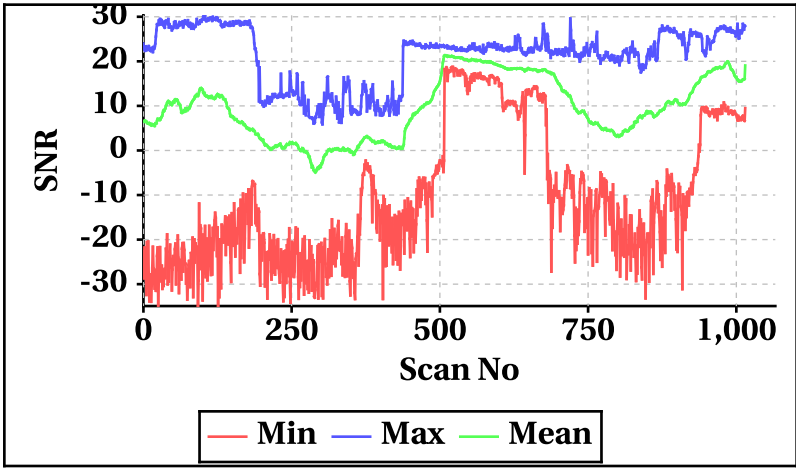
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-8	-5	-34	-34
Max	29	30	24	24

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-10	-6	-34	-34
Max	22	23	17	19

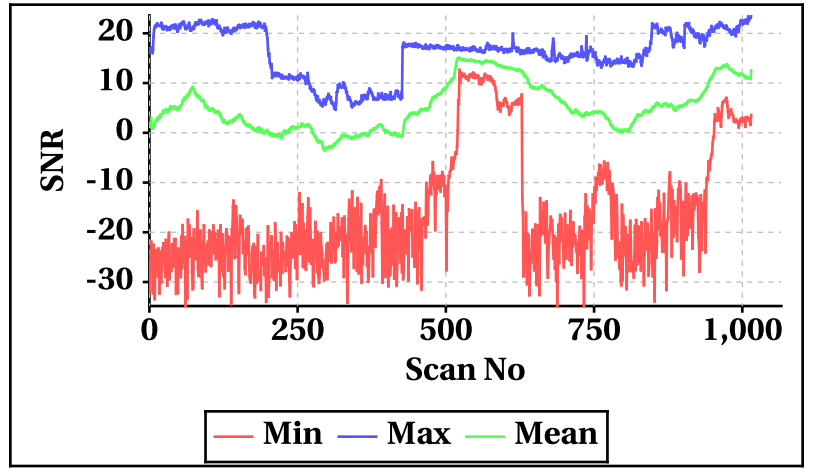


## Orbit-wise behaviour of SNR

**Inner Beam (HH)**

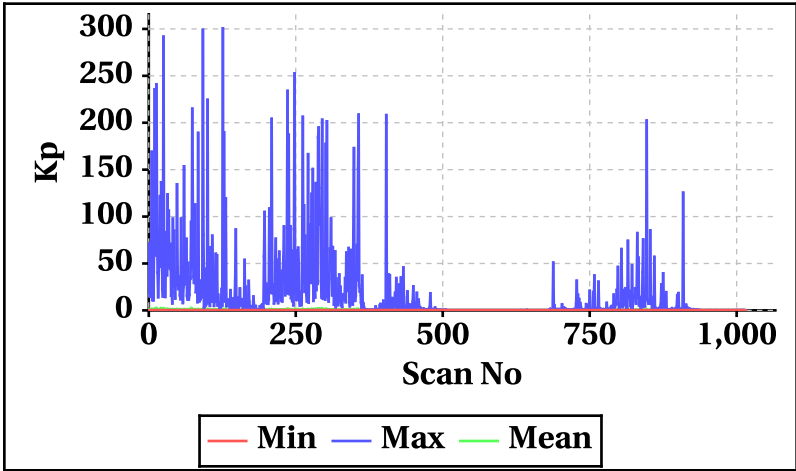


**Outer Beam (VV)**

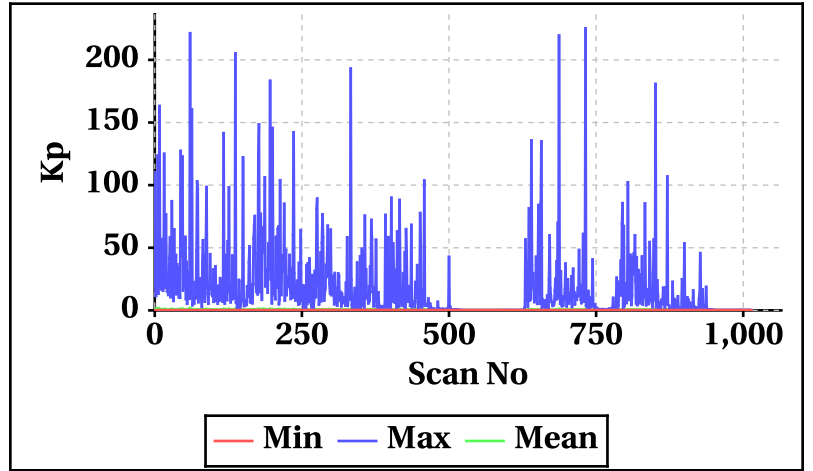


## Orbit-wise behaviour of Kp, Kpa, Kpb, Kpc

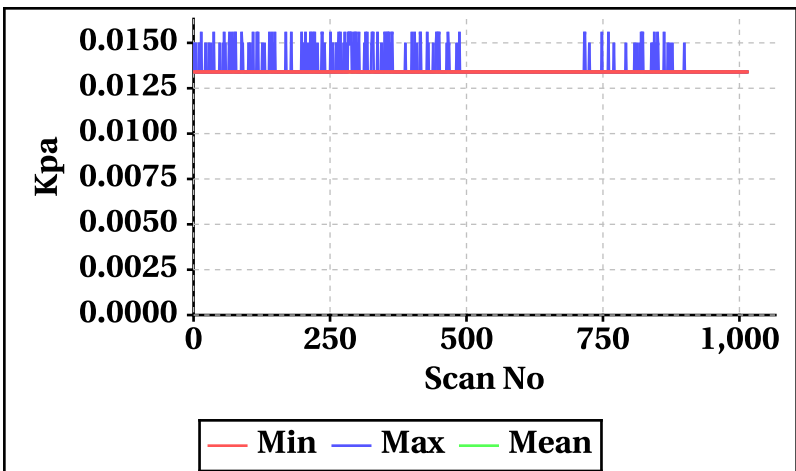
**Inner Beam (HH)**



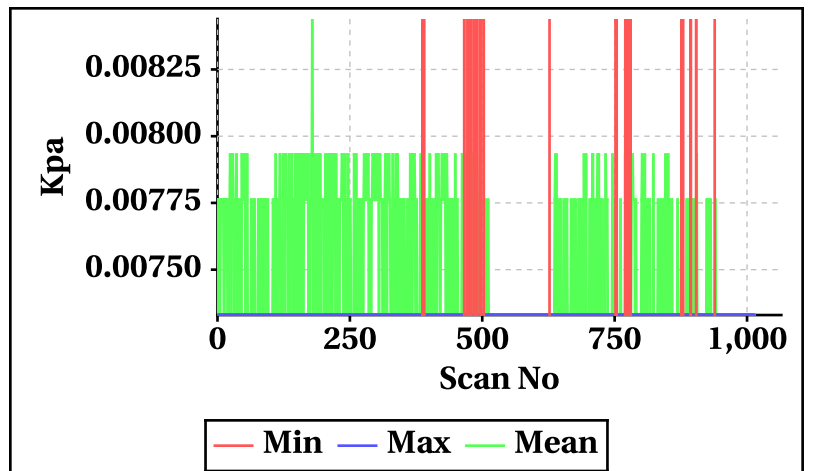
**Outer Beam (VV)**



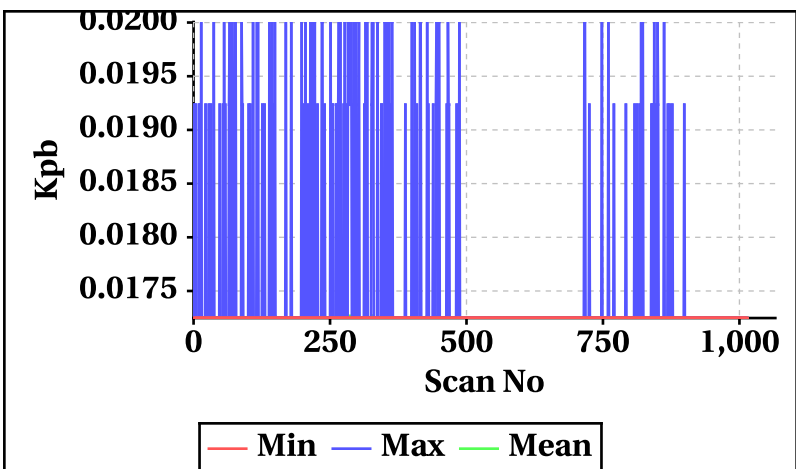
**Inner Beam (HH)**



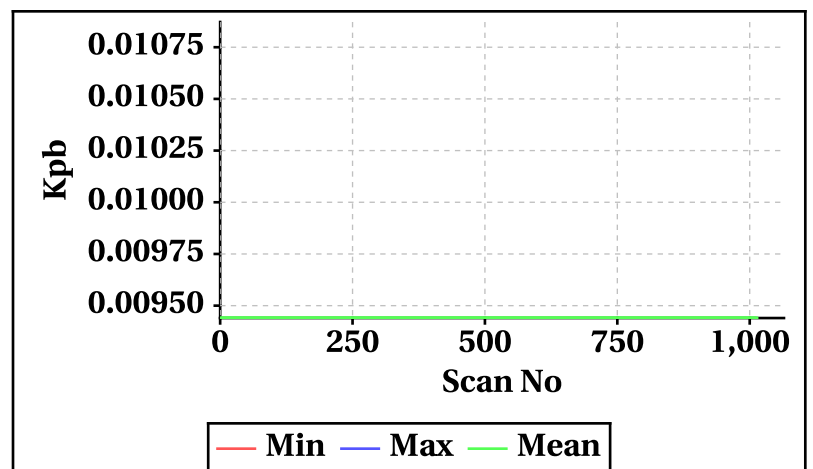
**Outer Beam (VV)**



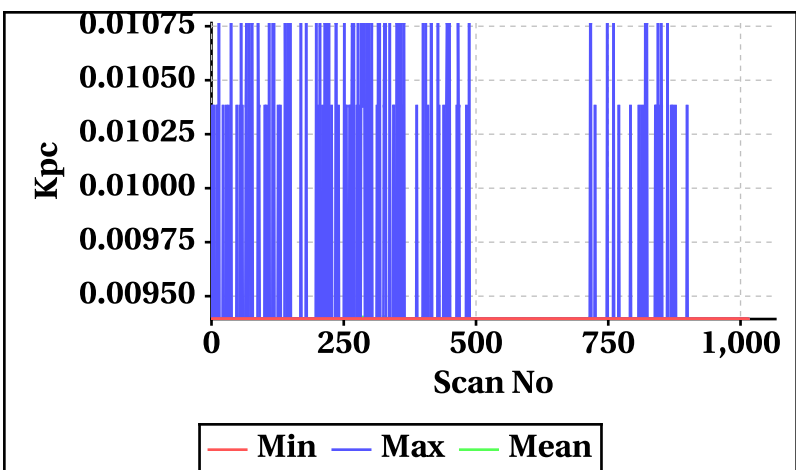
**Inner Beam (HH)**



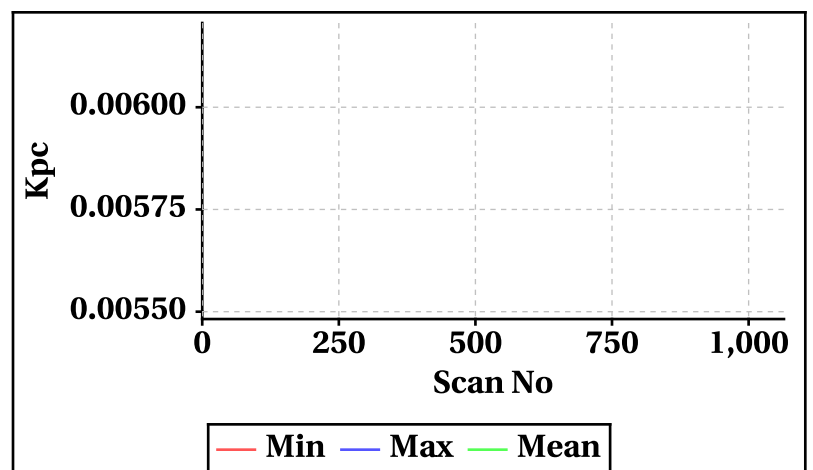
**Outer Beam (VV)**



**Inner Beam (HH)**



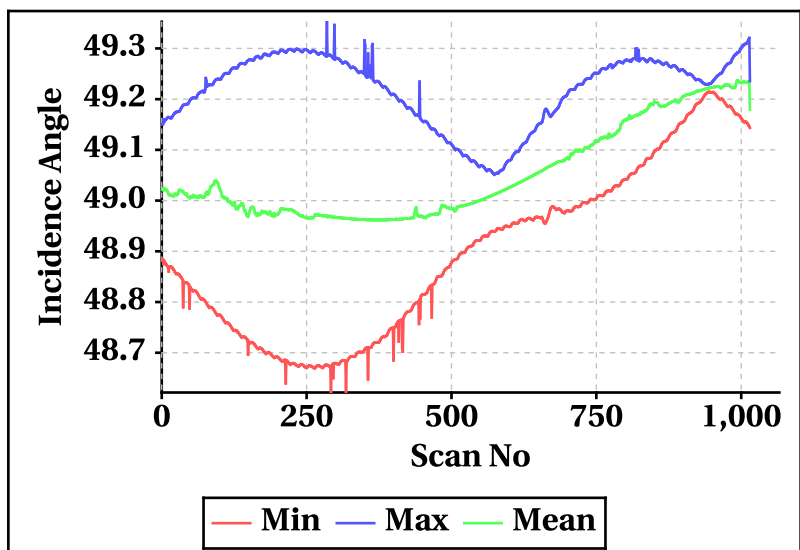
**Outer Beam (VV)**



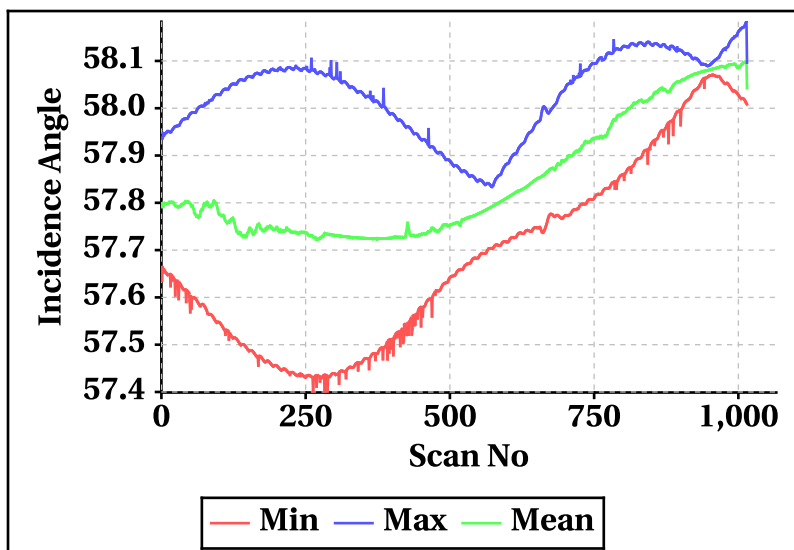


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

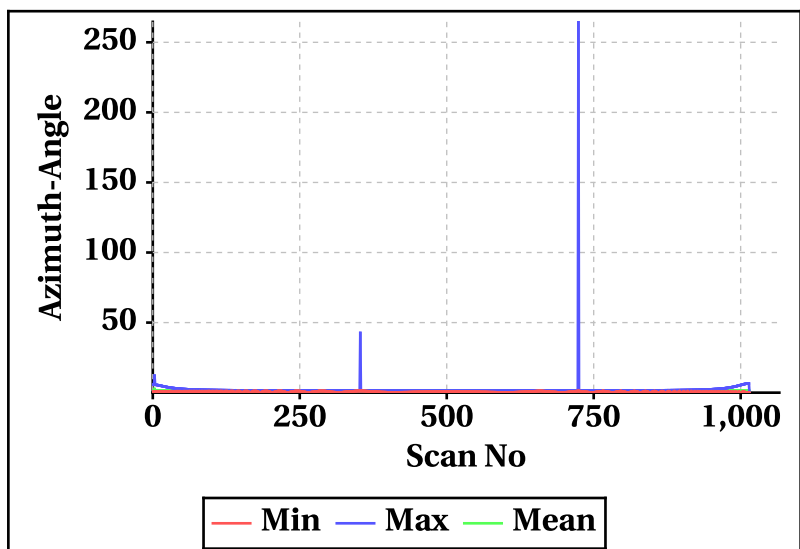
Inner Beam (HH)



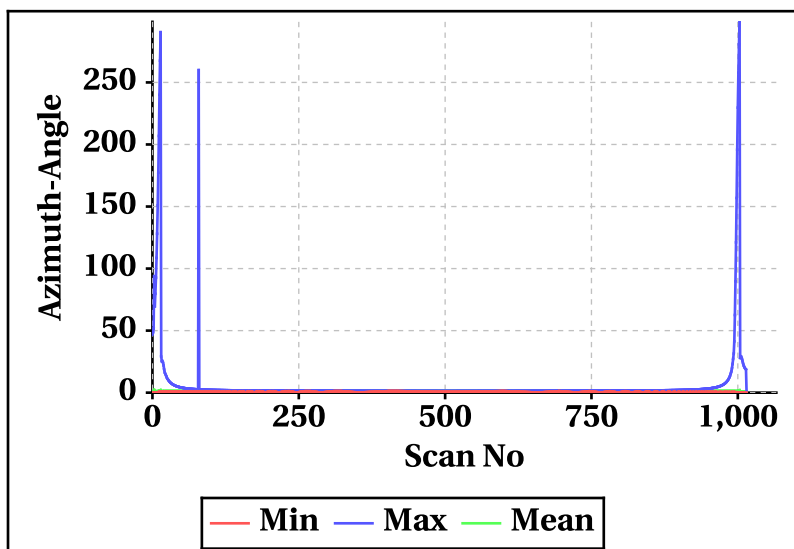
Outer Beam(VV)



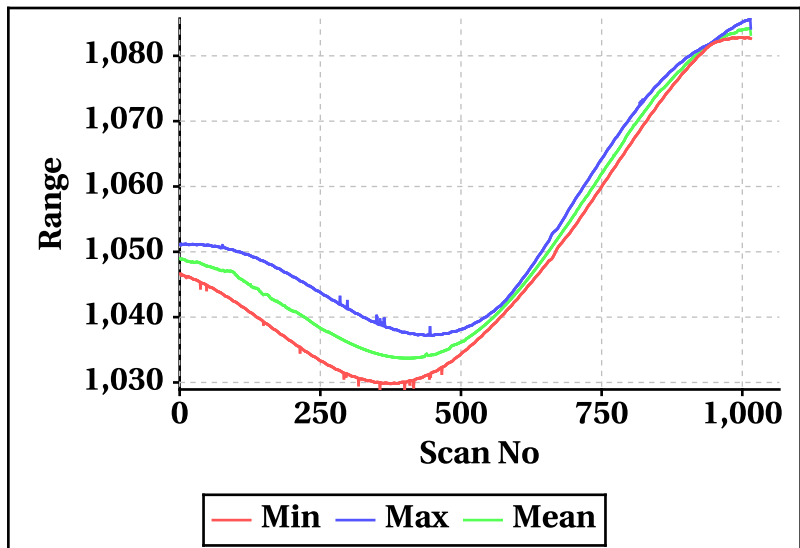
Inner Beam (HH)



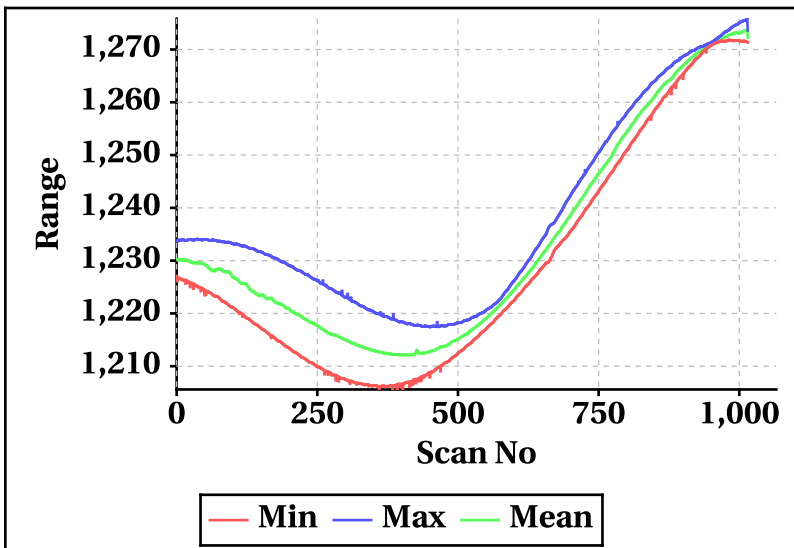
Outer Beam(VV)



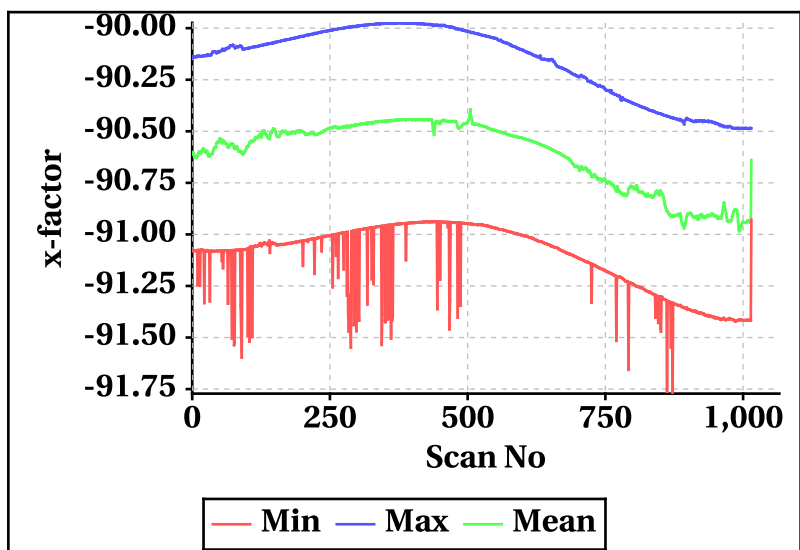
Inner Beam (HH)



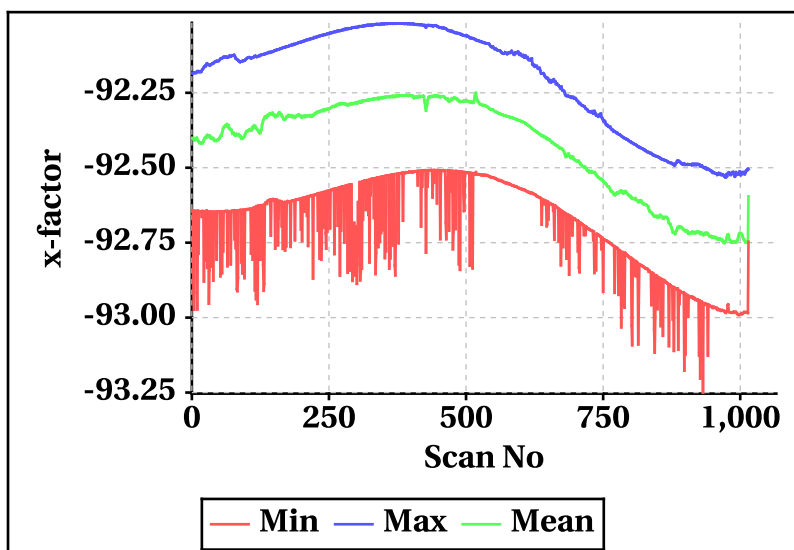
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

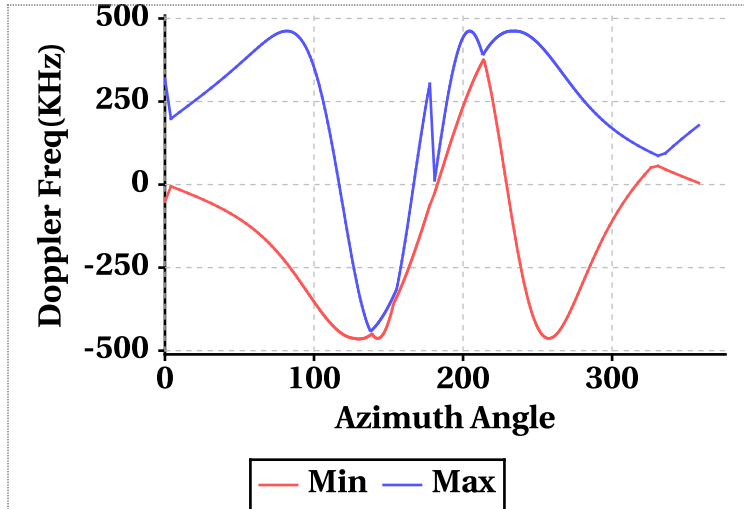


# Doppler Frequency Variation

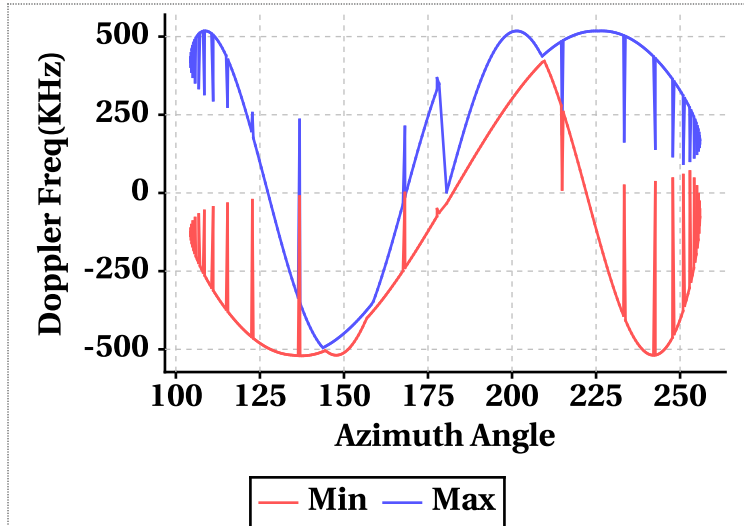
**Doppler Frequency(KHz) variation statistics Over the half Orbit**

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-464.88	-520.66
<b>Max</b>	462.14	518.16

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



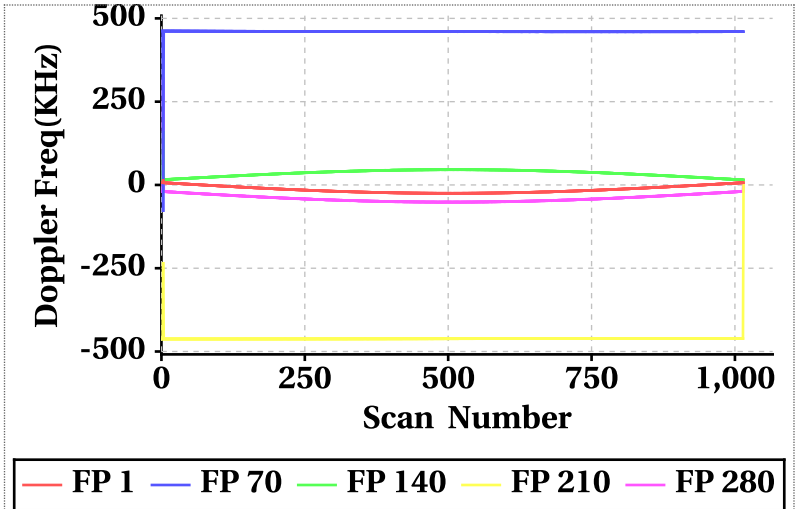
**Footprint wise Doppler frequency variation Outer Beam (VV)**



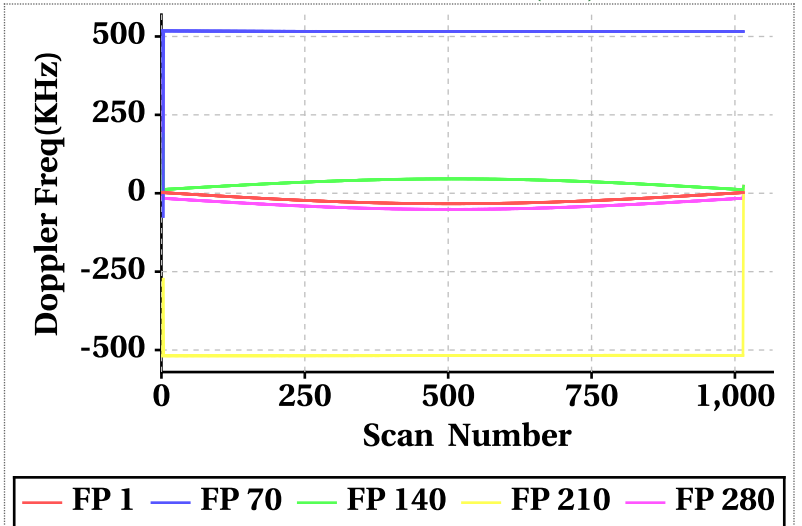
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-25.10	13.38	-13.40	-33.46	2.90	-20.42
Doppler_70	-76.88	461.98	459.96	-73.96	517.72	515.36
Doppler_140	15.06	157.80	34.85	11.32	188.56	33.49
Doppler_210	-462.44	15.06	-460.94	-518.42	22.68	-516.84
Doppler_280	-51.64	319.24	-39.44	-51.70	366.76	-38.09

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

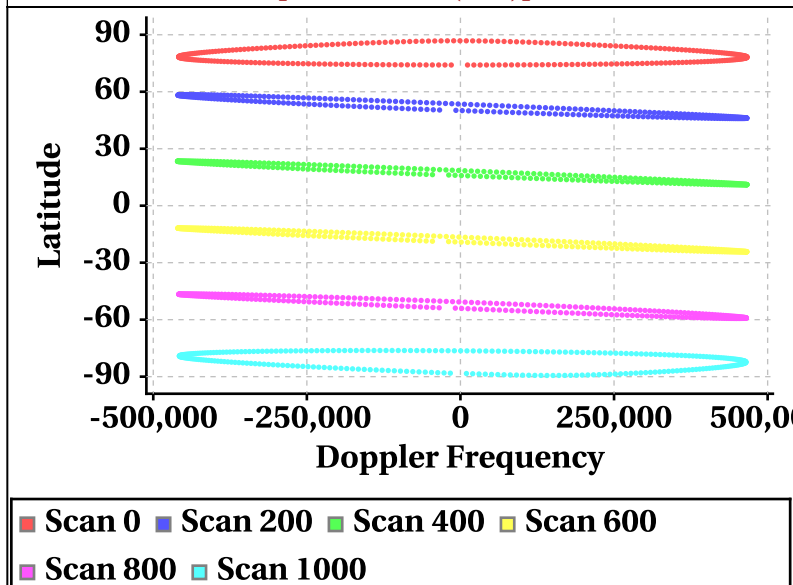


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

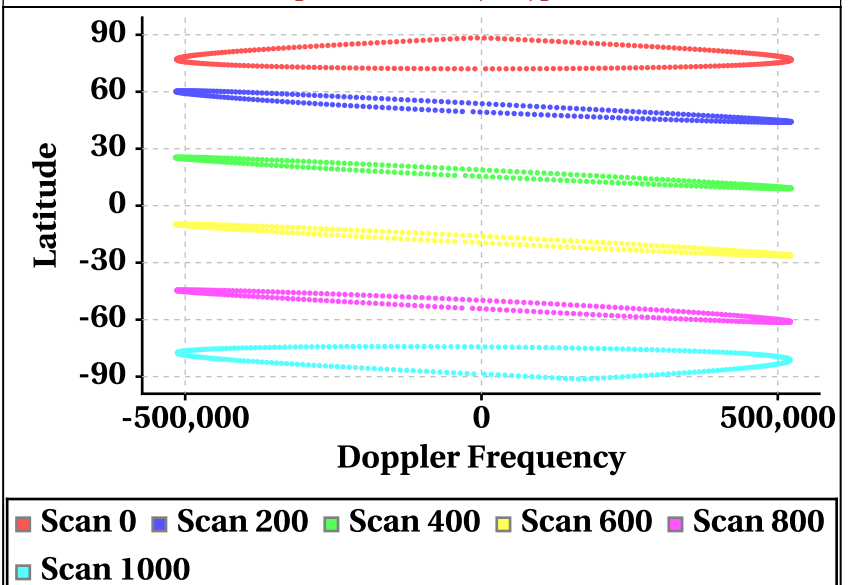


# Latitude Vs Doppler Frequency

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



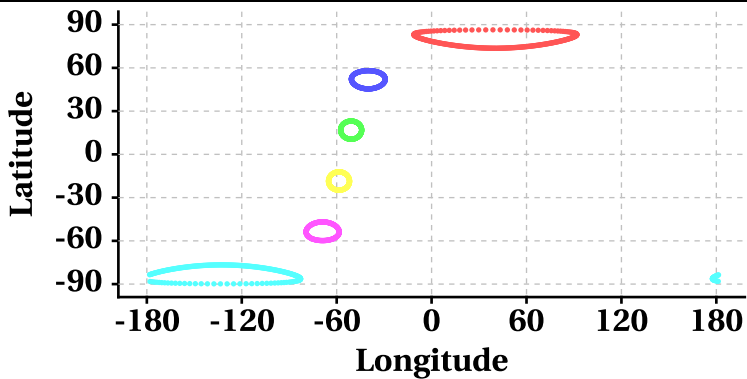
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

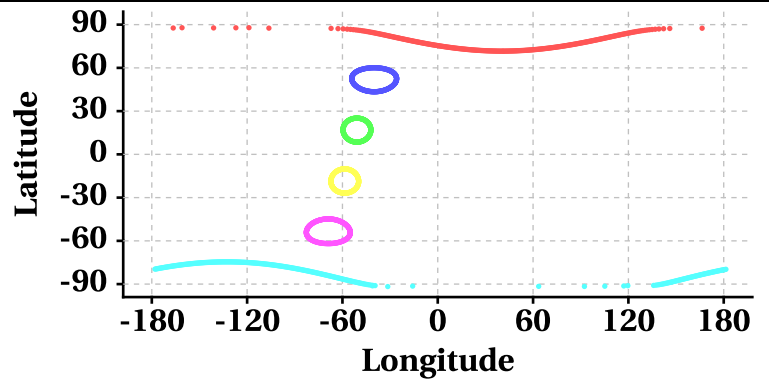
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

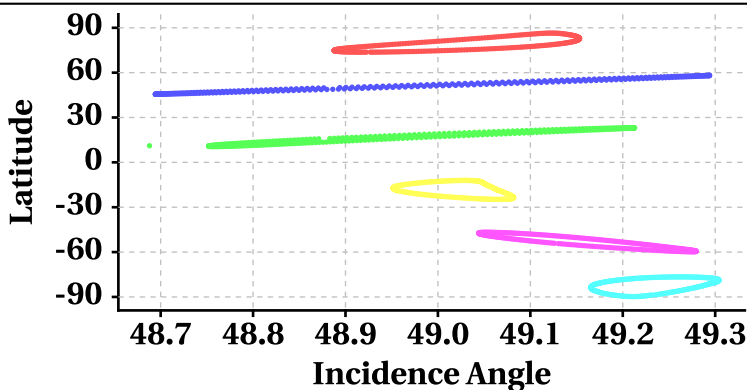
Scan Trace [Outer Beam (VV)]



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

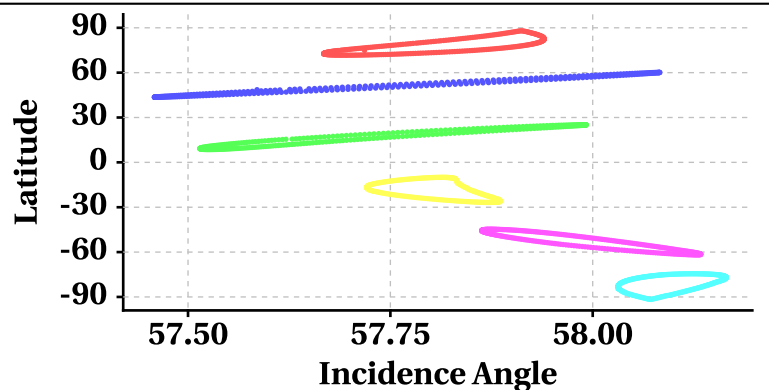
## Latitude Vs Incidence Angle

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



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

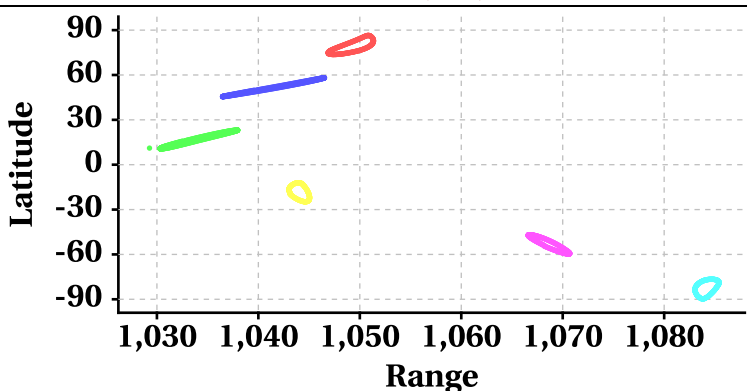
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

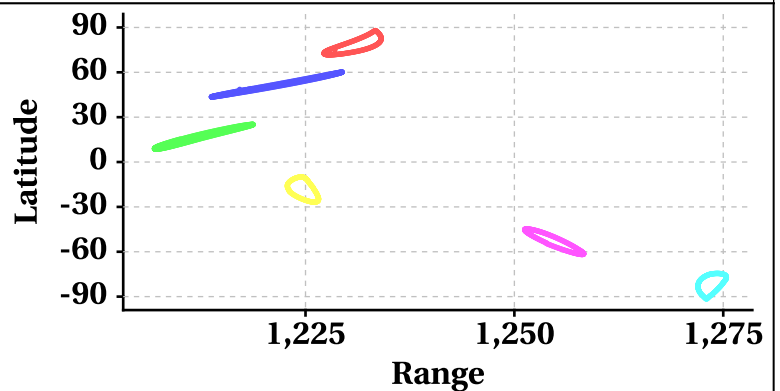
## Latitude Vs Range

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

