

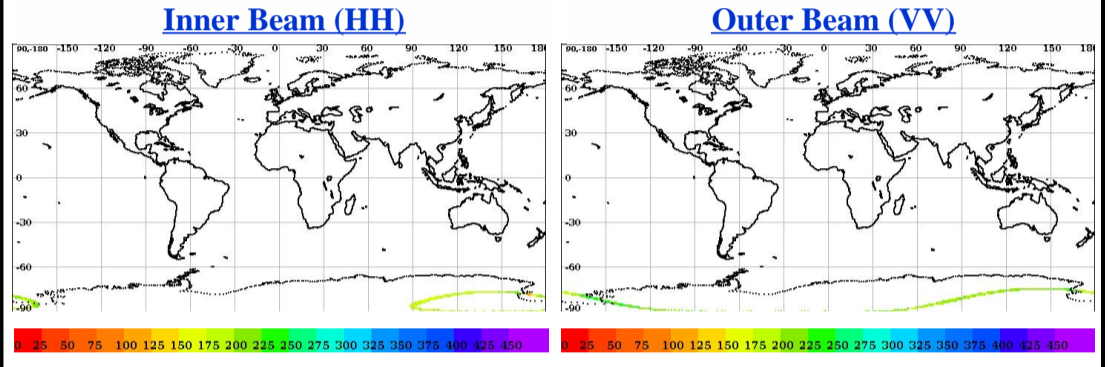
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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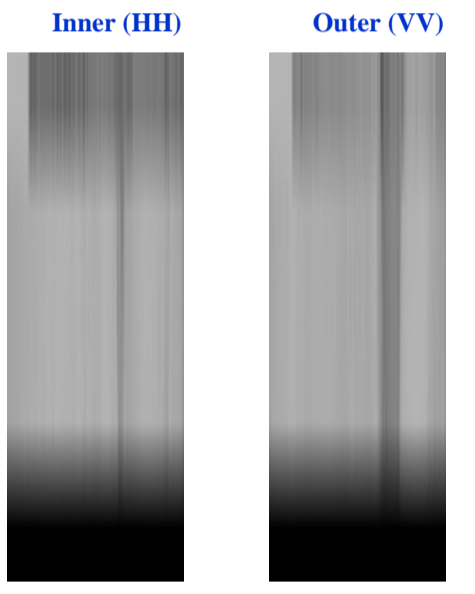
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	17247	<b>Total Scans</b>	4
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	17248	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	17247_17248	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	29-12-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	01-01-1970	<b>Equator Crossing Time</b>	null	<b>No Of Outer Slices</b>	15

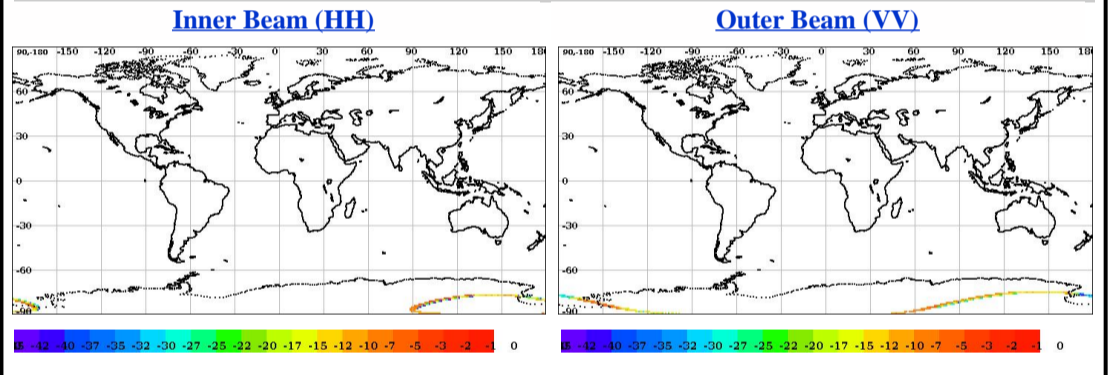
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



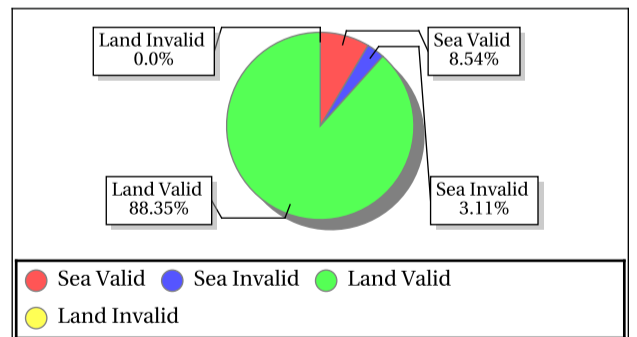
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
<b>Invalid Sigma0(%)</b>	12.84	13.53
Data Not Available From Payload (%)	24.24942	23.59108
Slice not within sample array limits (%)	75.75	76.41
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
<b>Poor Sigma0(%)</b>	21.54	12.91
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 (%)	0.045893	0.045767

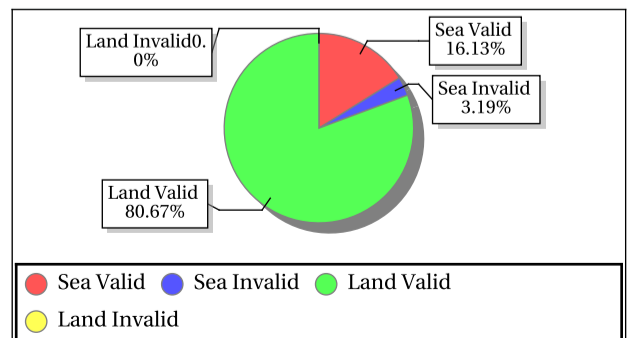
\*DP Format Document

## 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	Outer	DSC	Fore	-24.78	-23.58	-24.18	0.60	188.33	198.68	193.51	5.17



## 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. (%)
Kp	0.12	52.69	3.97	26.316	10000 0.00	-10000 0.00	0.00	0.000	0.12	7.89	0.28	4.310	0.12	23.02	0.59	12.098
Kpa	0.01	0.02	0.02	0.000	10000 0.00	-10000 0.00	0.00	0.000	0.01	0.02	0.02	0.000	0.01	0.03	0.02	0.000
Kpb	0.02	0.03	0.02	0.000	10000 0.00	-10000 0.00	0.00	0.000	0.02	0.03	0.02	0.000	0.02	0.04	0.02	0.000
Kpc	0.01	0.02	0.01	0.000	10000 0.00	-10000 0.00	0.00	0.000	0.01	0.02	0.01	0.000	0.01	0.02	0.01	0.000
SNR	-26.26	11.26	-0.47	0.000	10000 0.00	-10000 0.00	0.00	0.000	-17.96	26.37	15.09	39.224	-22.65	26.92	16.24	55.198

	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. (%)
Kp	0.10	133.97	2.48	19.685	10000 0.00	-10000 0.00	0.00	0.000	0.09	0.40	0.11	0.000	0.09	2.75	0.13	0.377
Kpa	0.01	0.01	0.01	0.000	10000 0.00	-10000 0.00	0.00	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
Kpb	0.01	0.02	0.01	0.000	10000 0.00	-10000 0.00	0.00	0.000	0.01	0.02	0.01	0.000	0.01	0.02	0.01	0.000
Kpc	0.01	0.01	0.01	0.000	10000 0.00	-10000 0.00	0.00	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
SNR	-31.40	6.10	-7.02	0.000	10000 0.00	-10000 0.00	0.00	0.000	-4.99	20.34	12.30	0.000	-14.38	19.98	11.84	0.000

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)

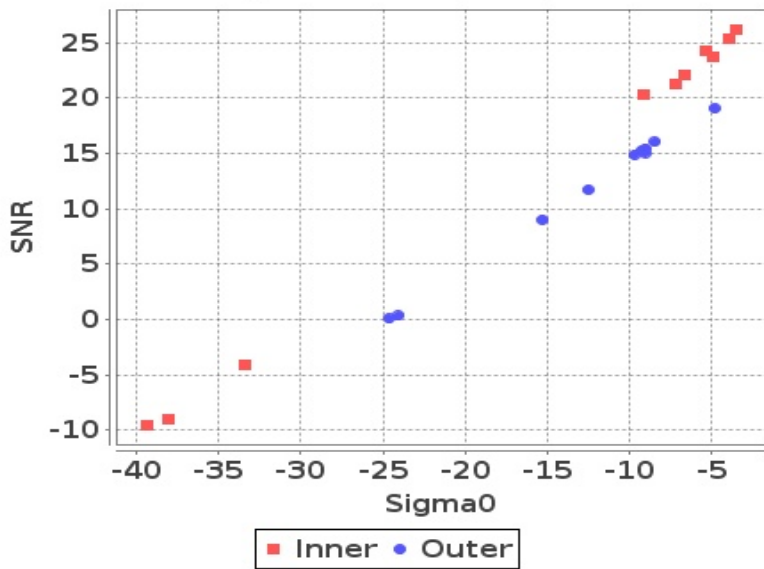
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
Incidence Angle (deg)	48.87	49.29	49.17	0.000	57.66	58.34	58.02	0.000	Inci.(Inner)	47.10	49.90
Azimuth Diff. (deg)	0.0468	6.68	1.20	11.858	0.0000	19.14	0.89	48.312	Inci.(Outer)	57.30	58.90
Range(Km)	1078.61	1085.98	1083.90	0.000	1263.14	1280.86	1272.45	0.096	Azimuth Diff.	0.60	2.00
X Factor(dbm)	-93.67	-90.45	-91.39	0.000	-96.14	-92.49	-93.31	0.000	Range(Inner)	1025.00	1095.70
Across Distance (Km)	16.02	16.54	16.18	0.000	21.10	22.76	21.31	3.000	Range(Outer)	1210.00	1280.00
Along Distance (Km)	19.15	19.86	14.66	0.000	19.20	22.28	15.48	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
									<span style="display: inline-block; width: 15px; height: 15px; background-color: #008000; border: 1px solid black; margin-right: 5px;"></span> Normal <span style="display: inline-block; width: 15px; height: 15px; background-color: #ffa500; border: 1px solid black; margin-left: 20px; margin-right: 5px;"></span> Alarming		
									<span style="display: inline-block; width: 15px; height: 15px; background-color: #ffff00; border: 1px solid black; margin-right: 5px;"></span> Deviations <span style="display: inline-block; width: 15px; height: 15px; background-color: #ff0000; border: 1px solid black; margin-left: 20px; margin-right: 5px;"></span> High Errors		



## Sigma0 Behaviour (Sigma0 Vs SNR)

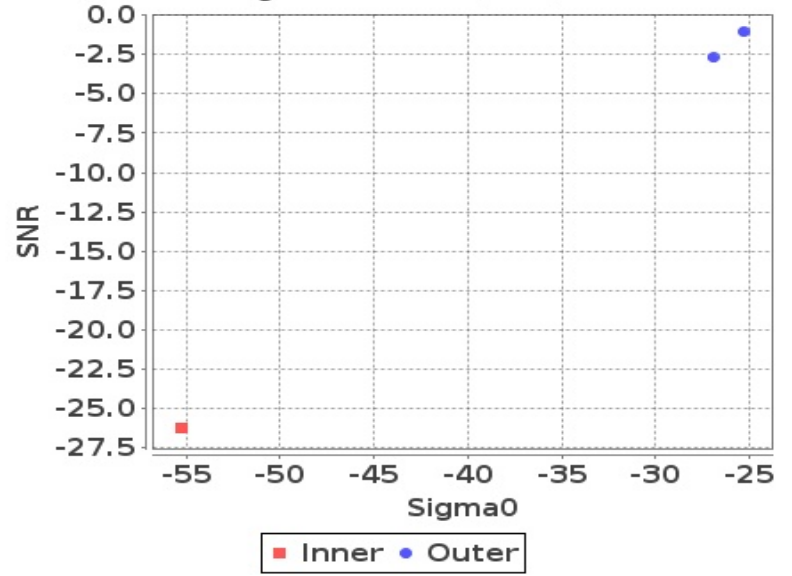
Footprint-Land

Sigma0 Vs SNR (Land)



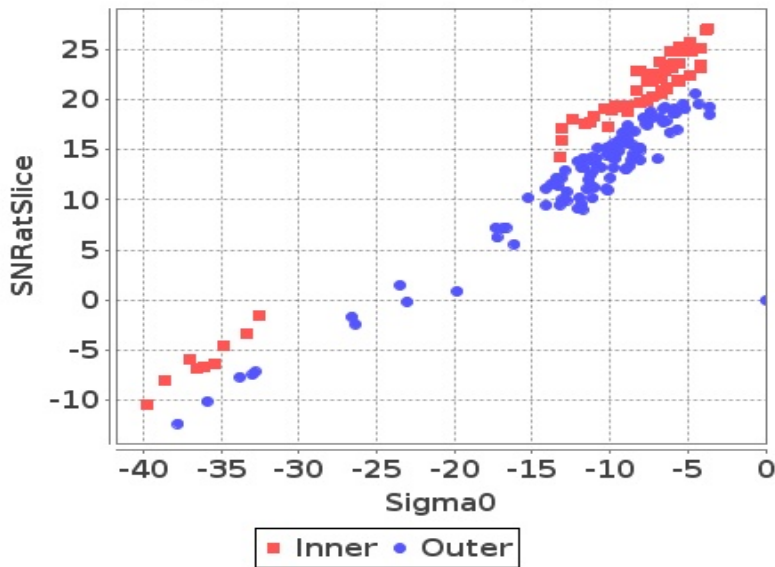
Footprint-Sea

Sigma0 Vs SNR (Sea)



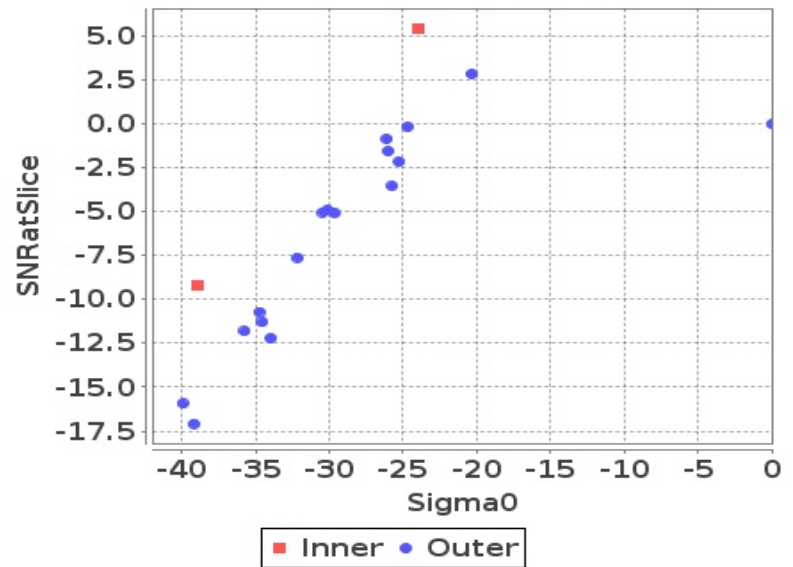
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

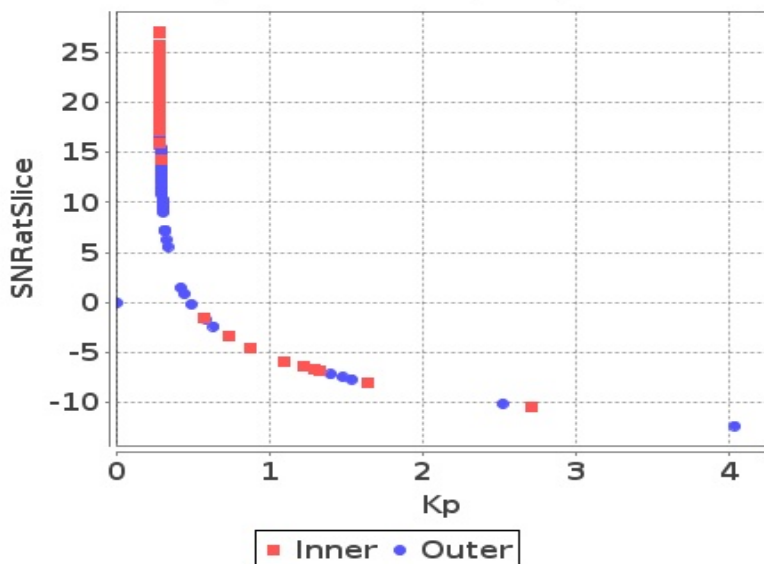
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

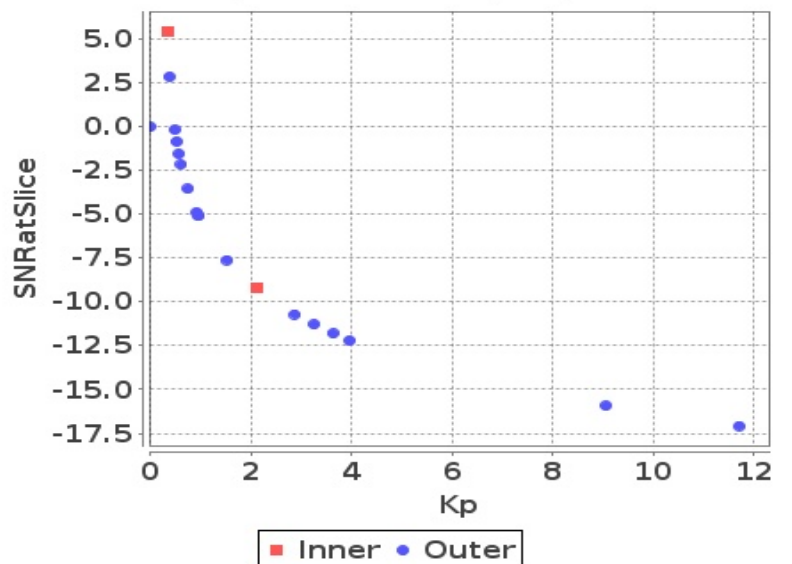
Slice

Kp Vs SNRatSlice (Land)



Slice

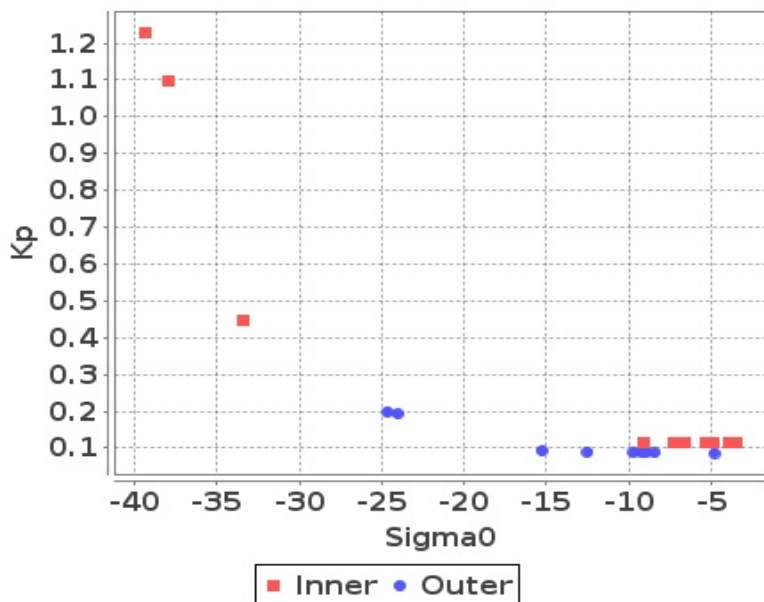
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

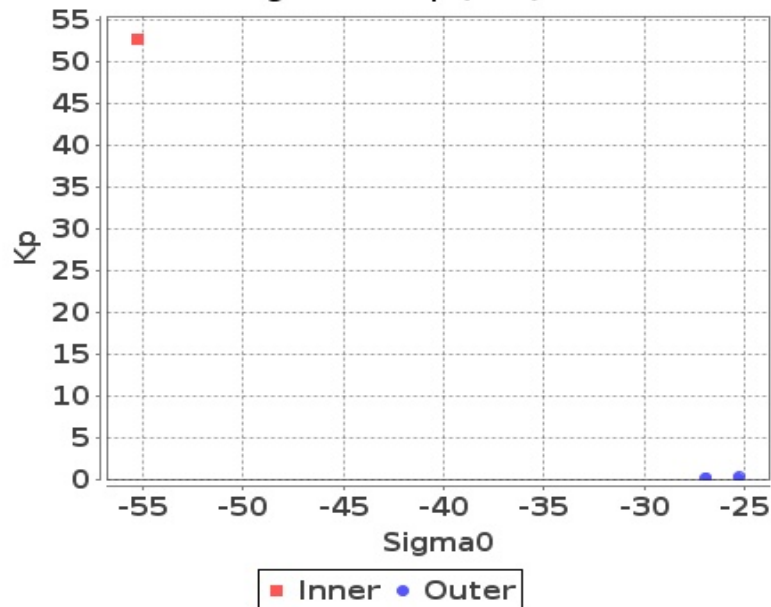
## Footprint-Land

### Sigma0 Vs Kp (Land)



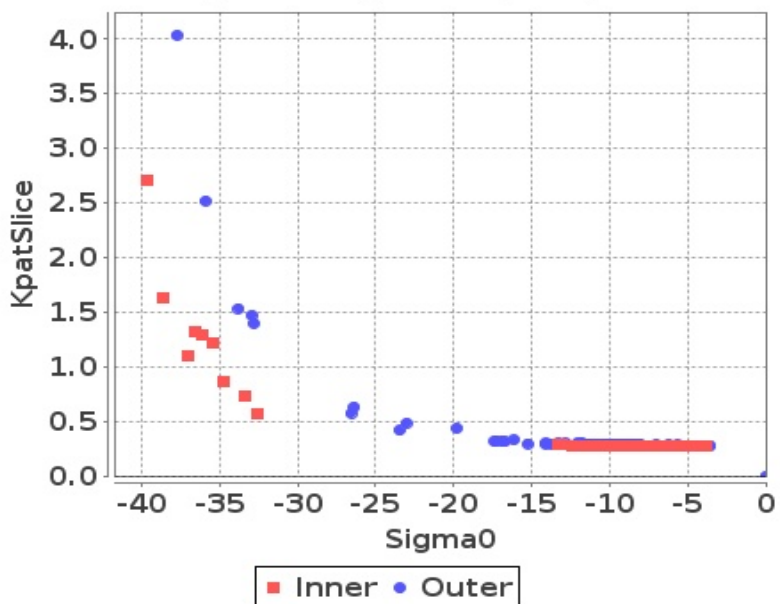
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



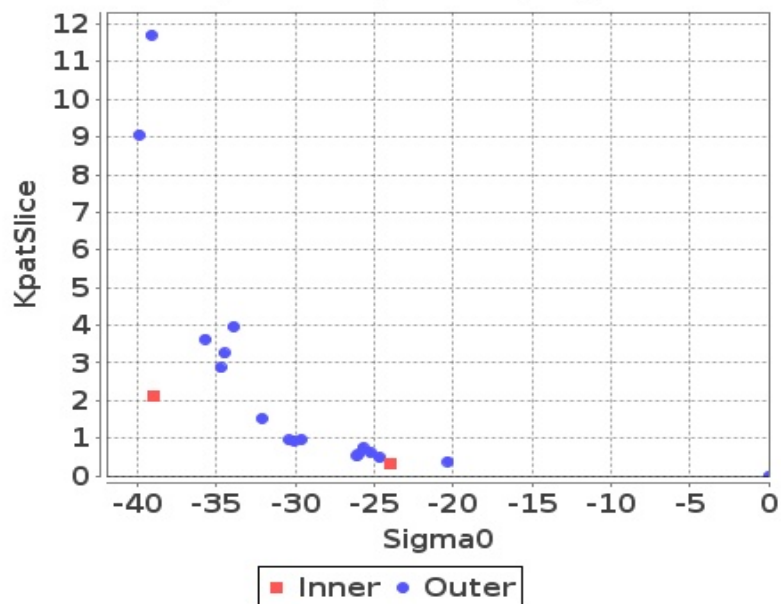
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

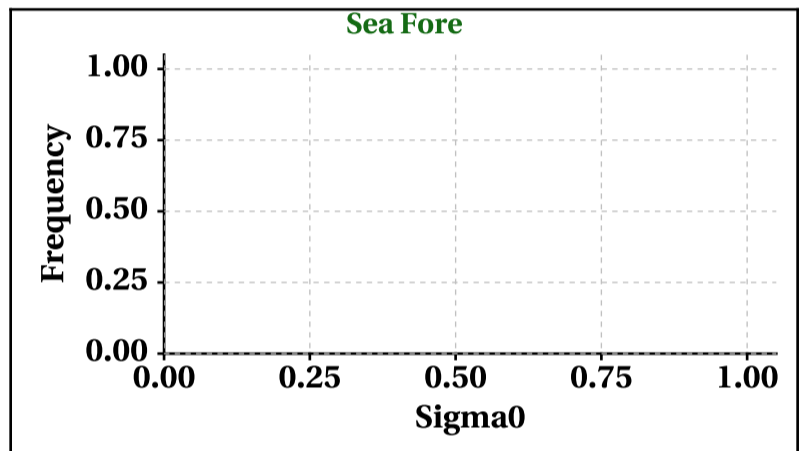
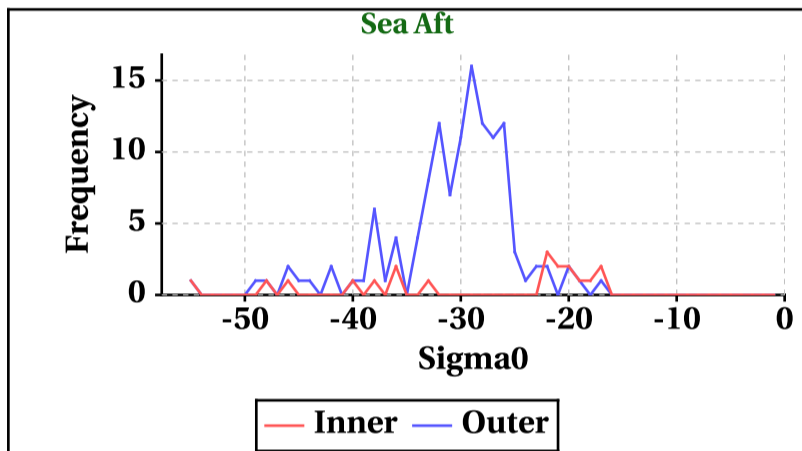
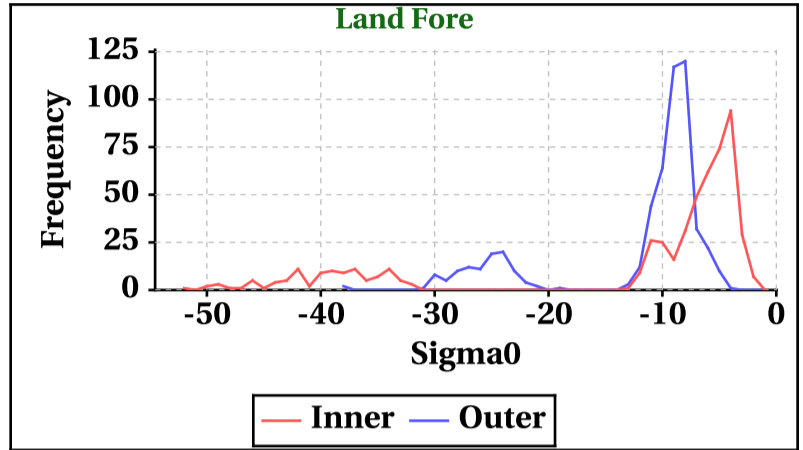
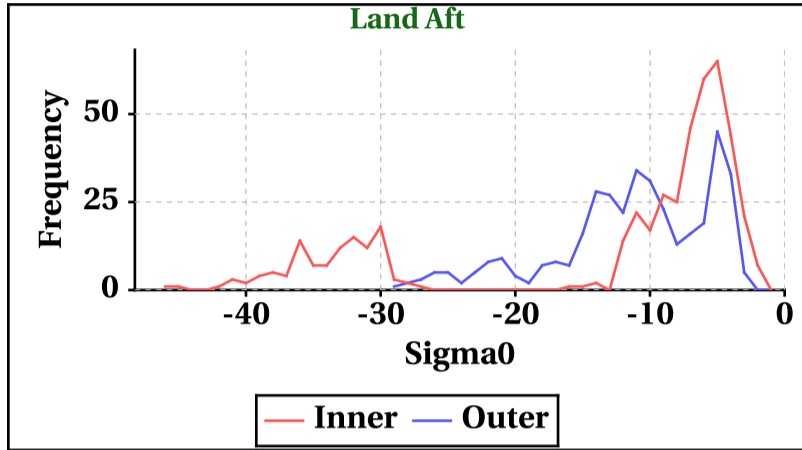


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-46	-52	-55	0
Max	0	0	0	0

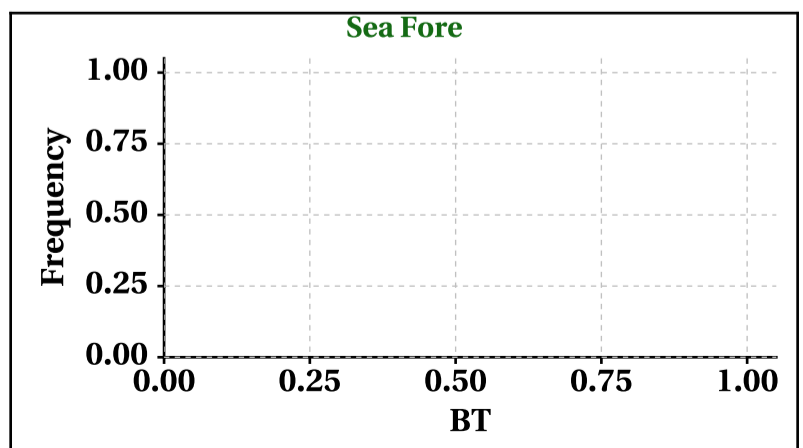
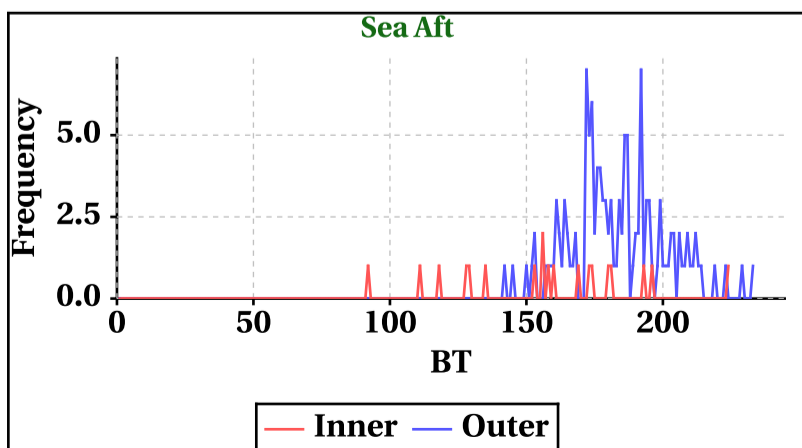
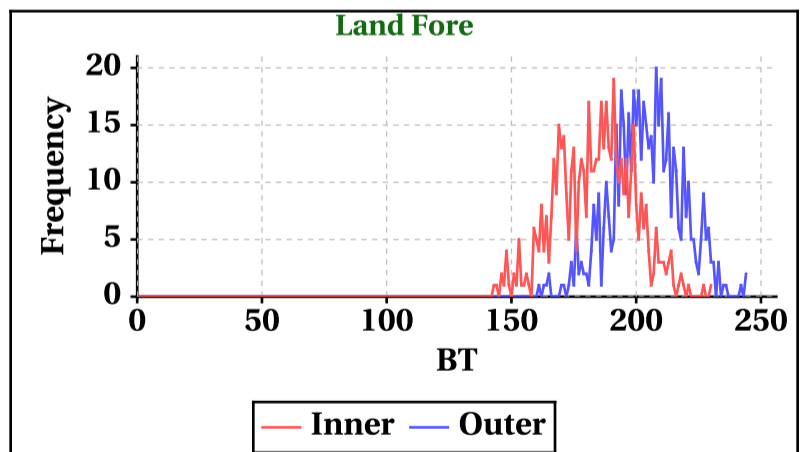
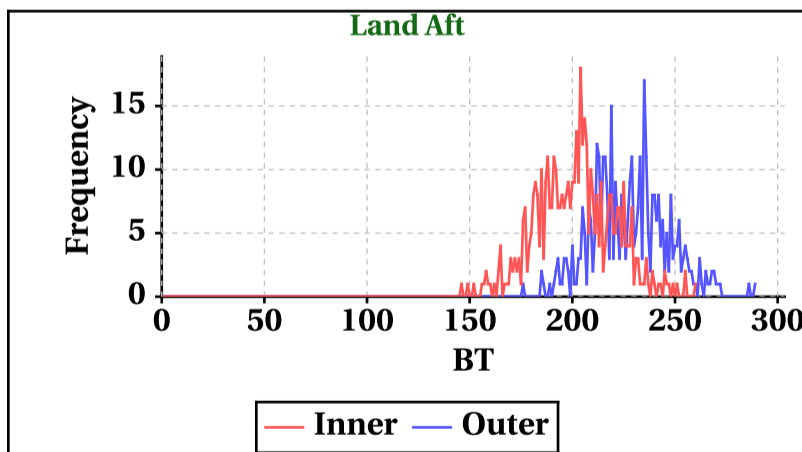
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-29	-38	-55	0
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	260	230	224	0

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	289	244	233	0



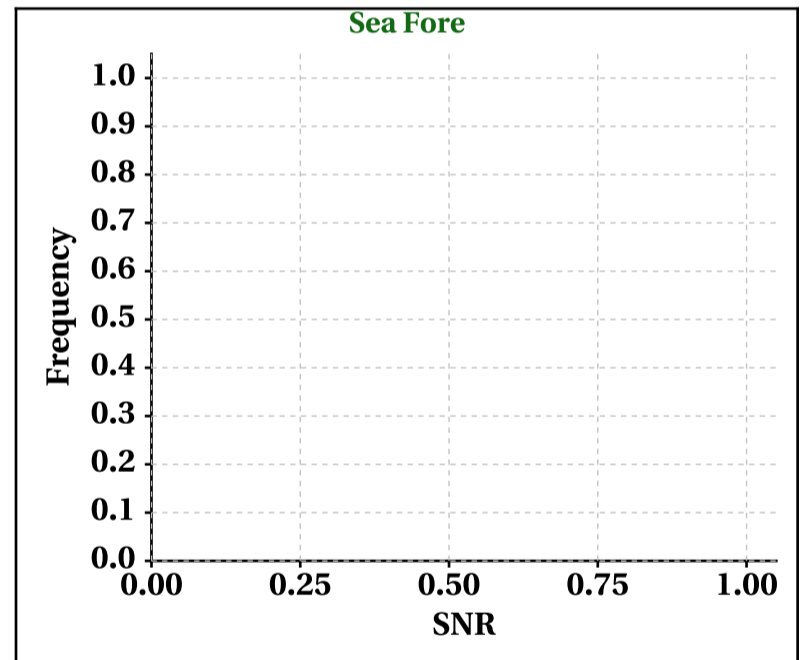
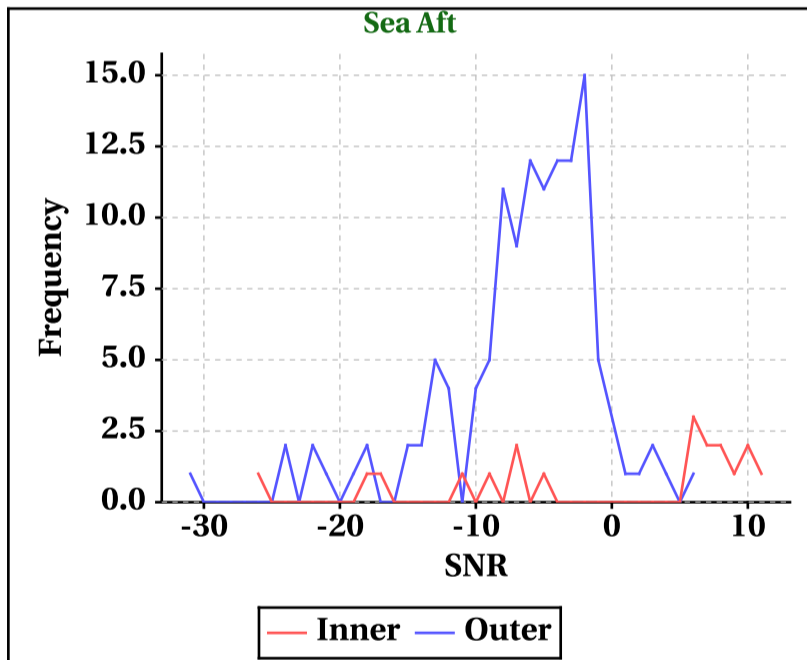
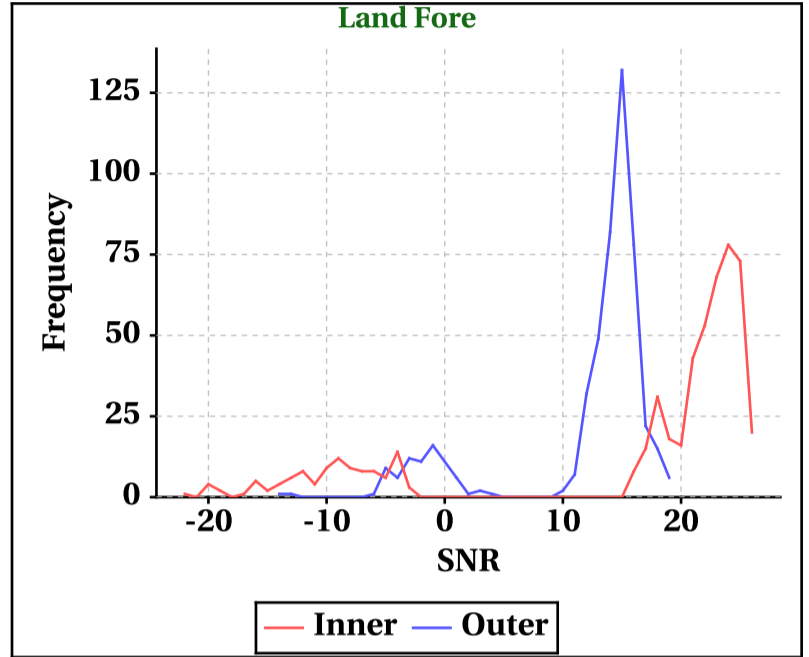
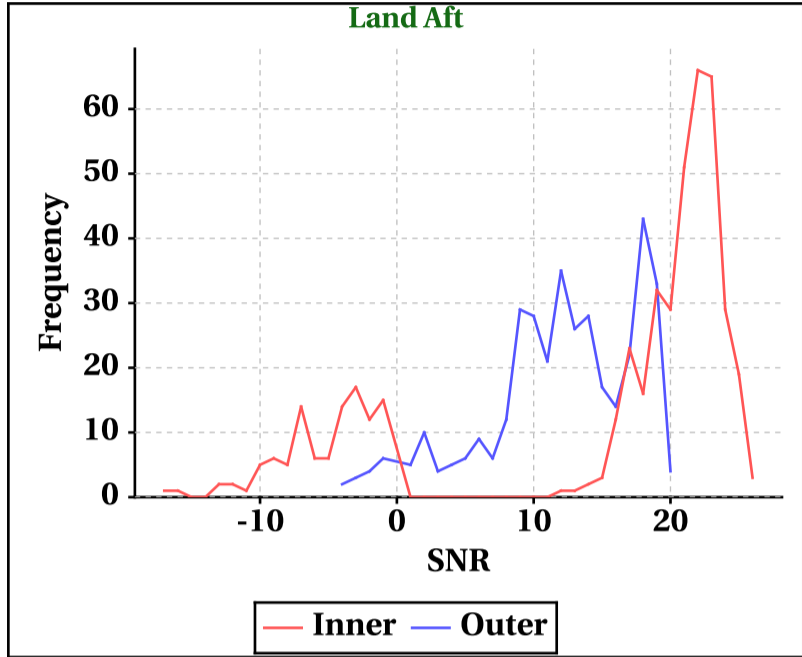


# Dynamic Range (Data Histograms)

## SNR(dBm)

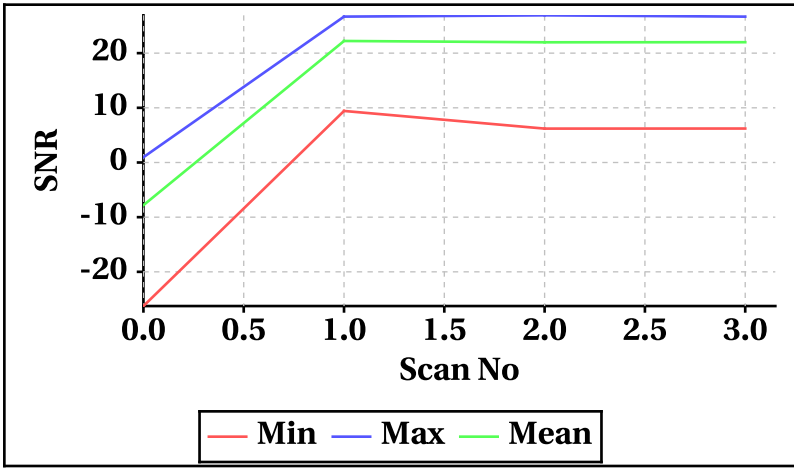
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-17	-22	-26	0
Max	26	26	11	0

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-4	-14	-31	0
Max	20	19	6	0

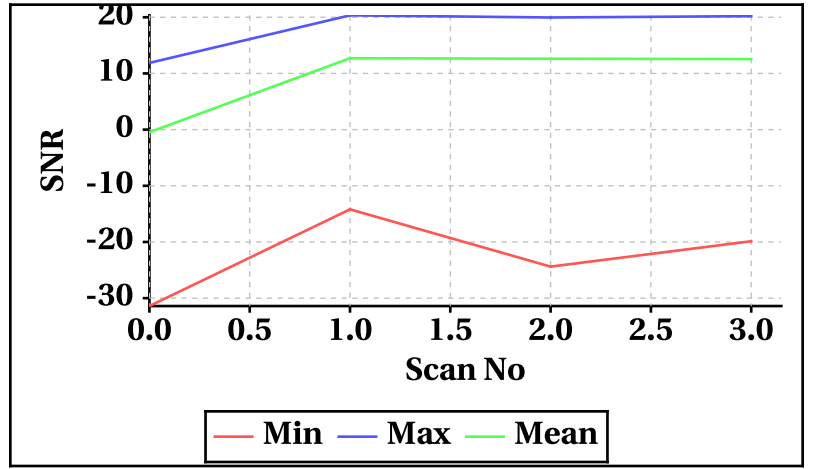


## Orbit-wise behaviour of SNR

Inner Beam (HH)

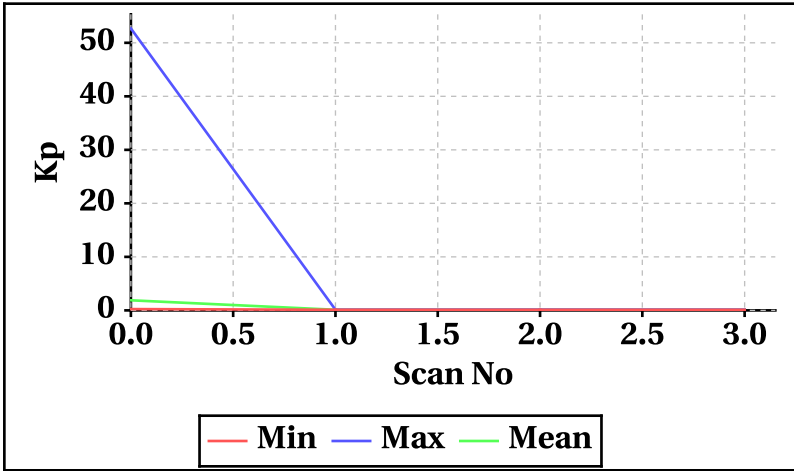


Outer Beam(VV)

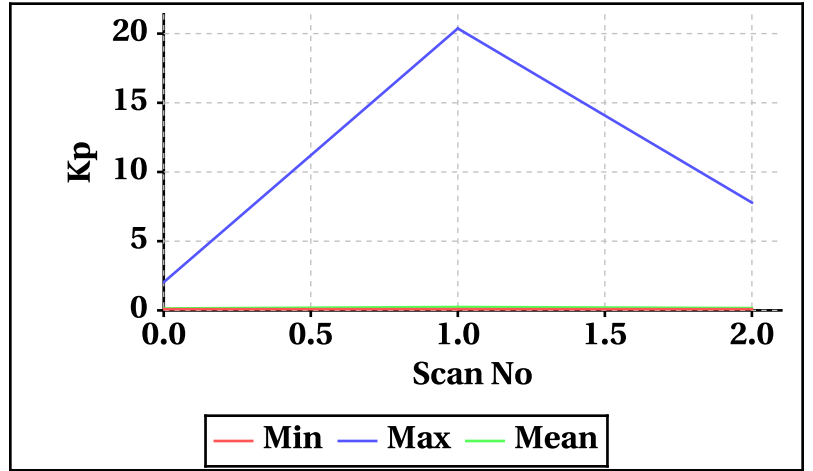


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

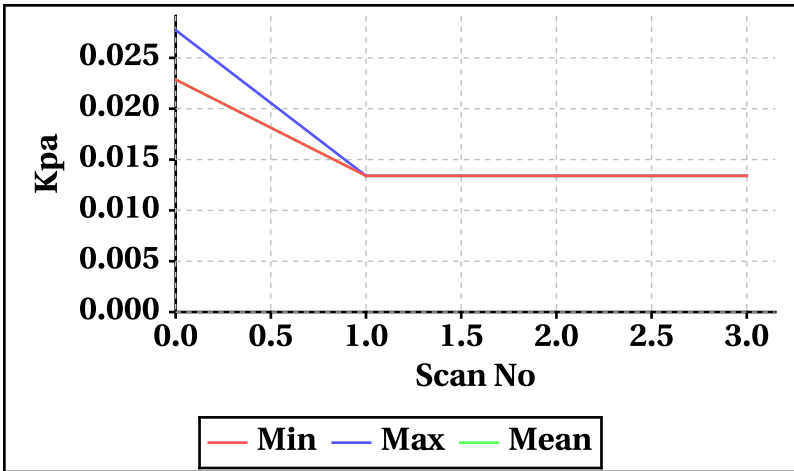
Inner Beam(HH)



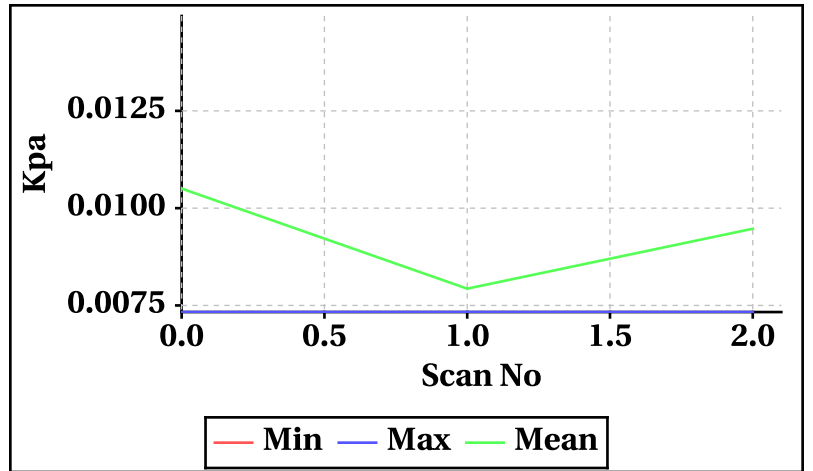
Outer Beam(VV)



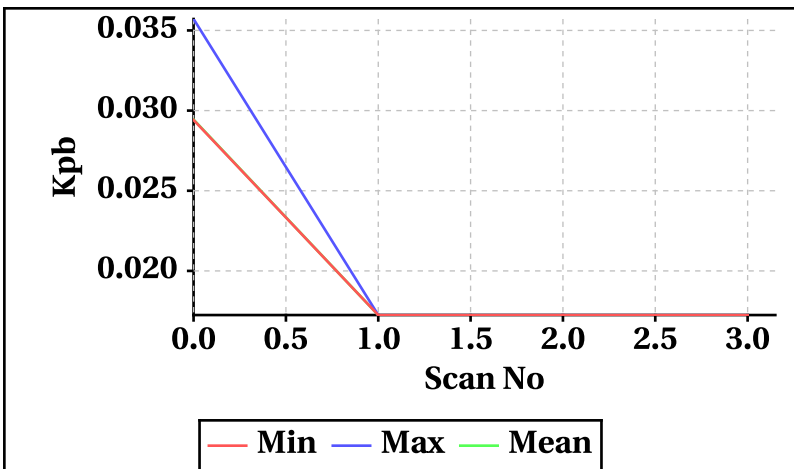
Inner Beam(HH)



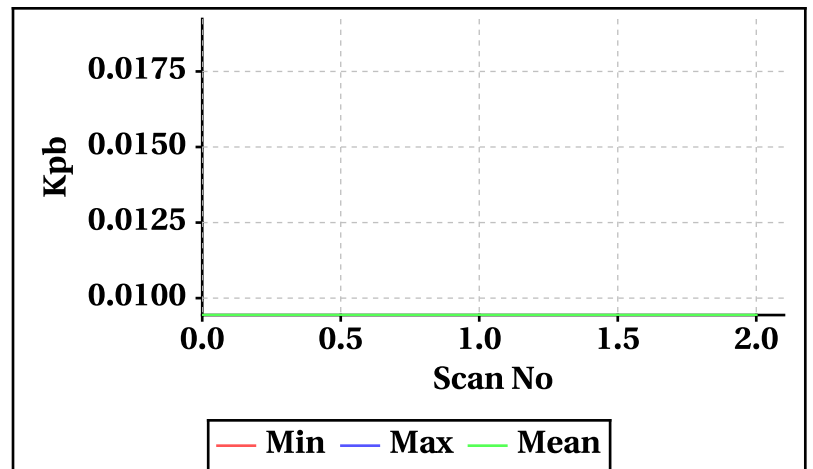
Outer Beam(VV)



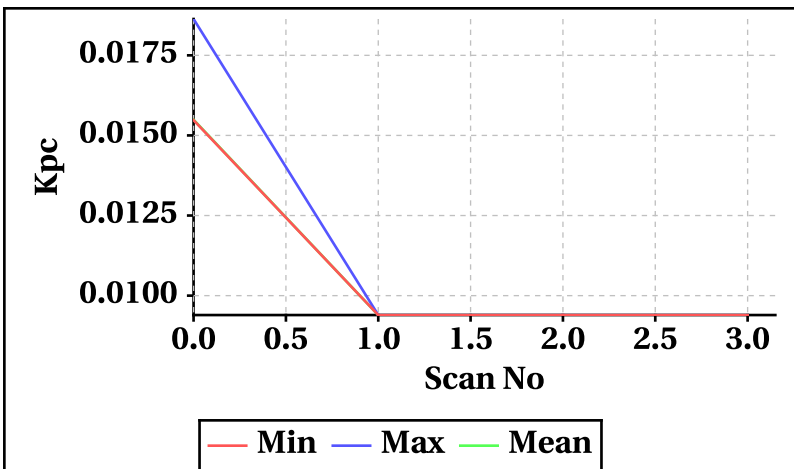
Inner Beam(HH)



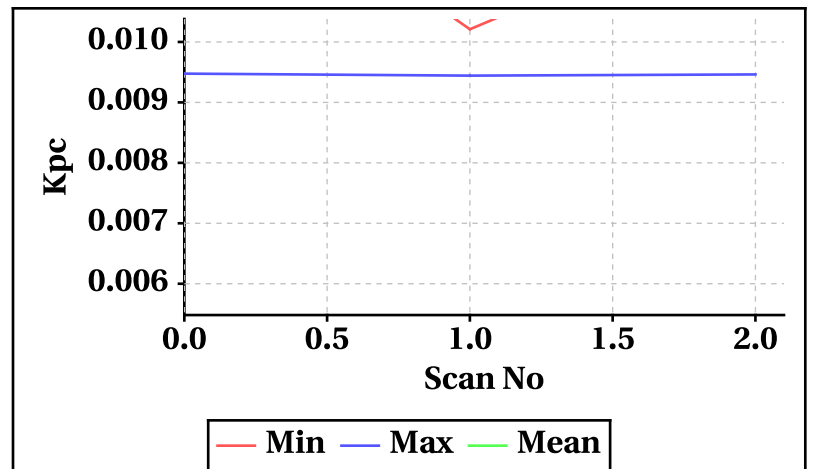
Outer Beam(VV)



Inner Beam(HH)



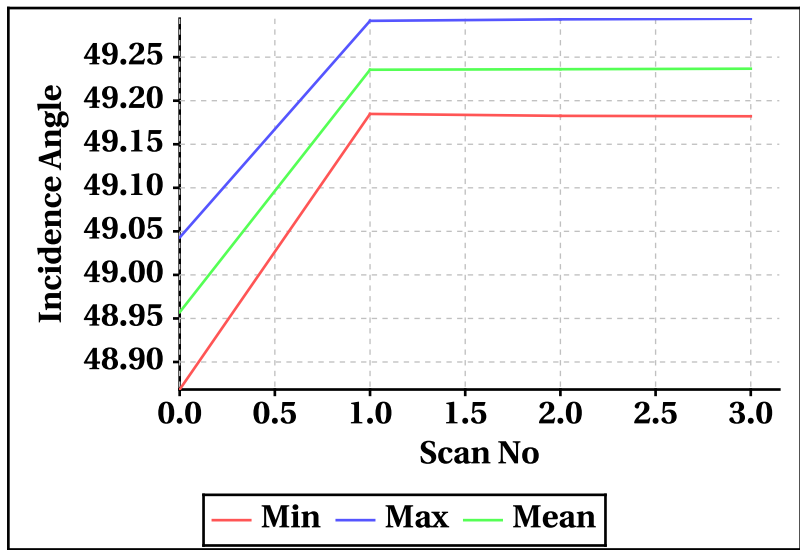
Outer Beam(VV)



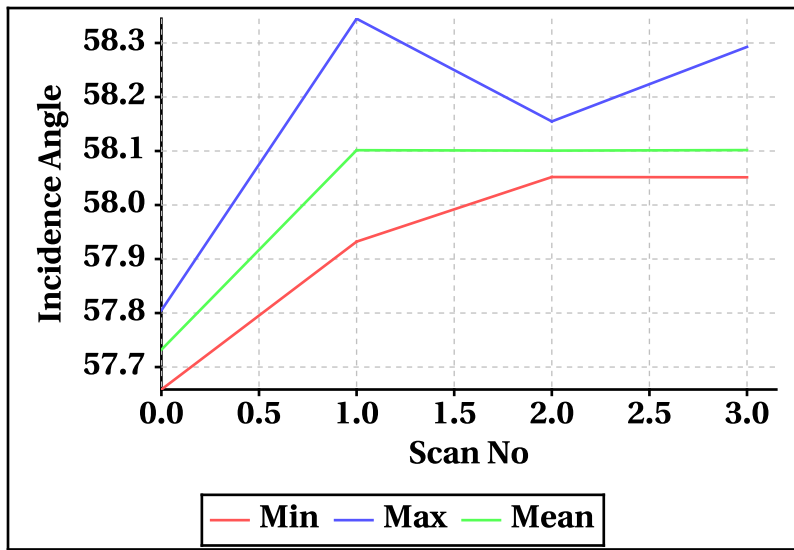


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

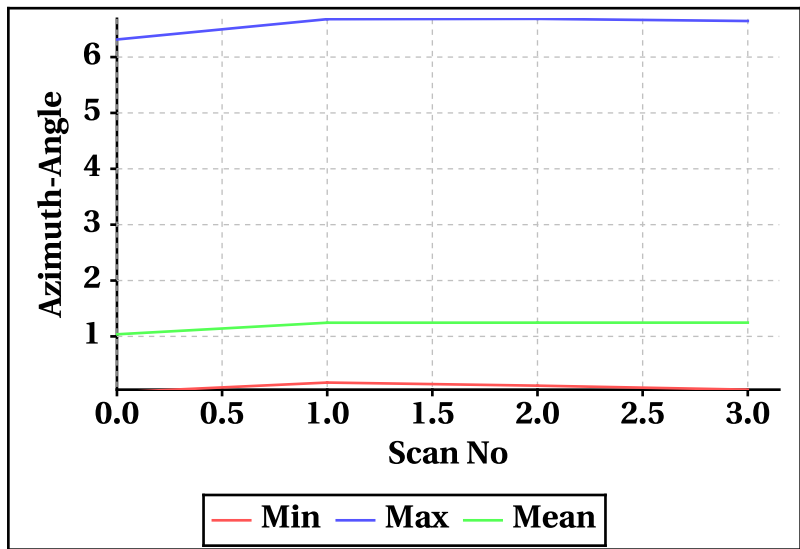
Inner Beam (HH)



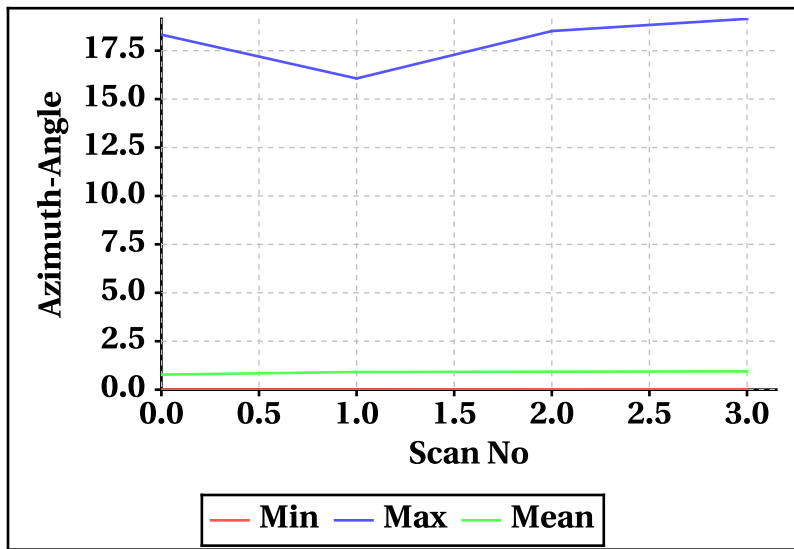
Outer Beam(VV)



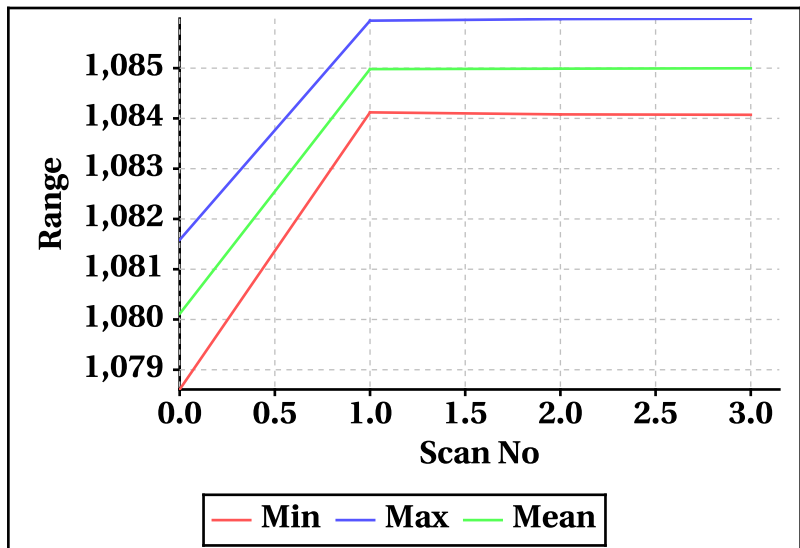
Inner Beam (HH)



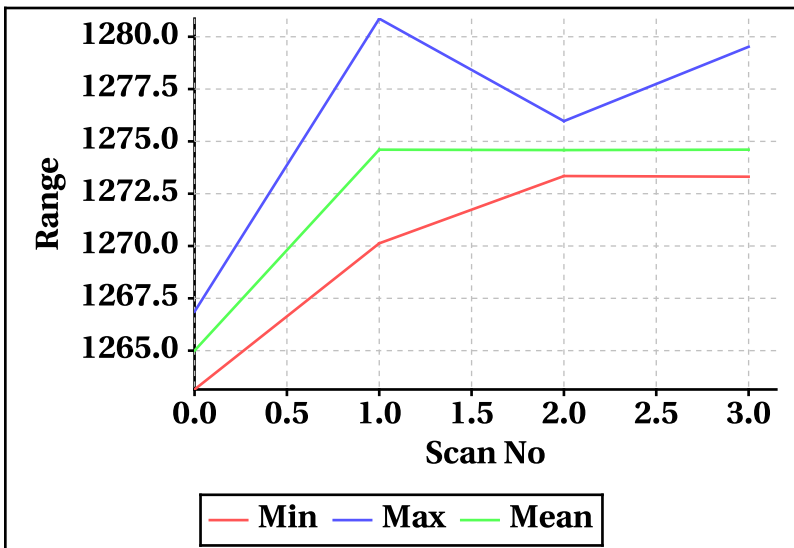
Outer Beam(VV)



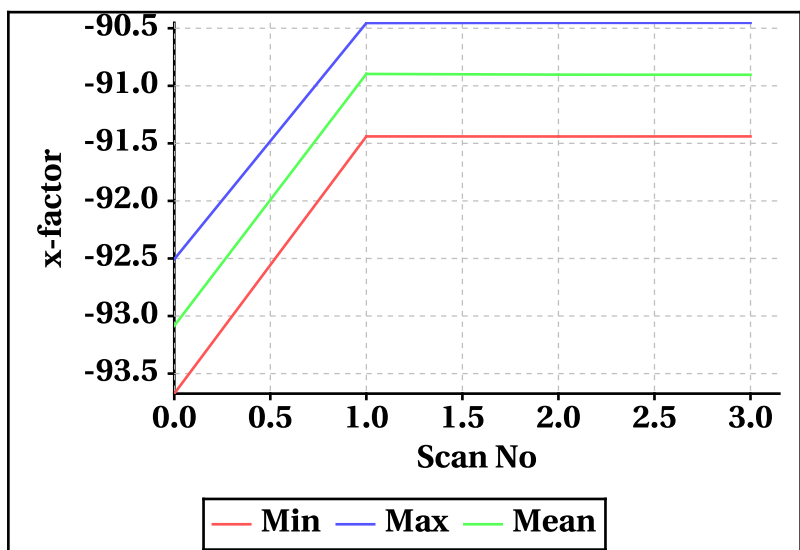
Inner Beam (HH)



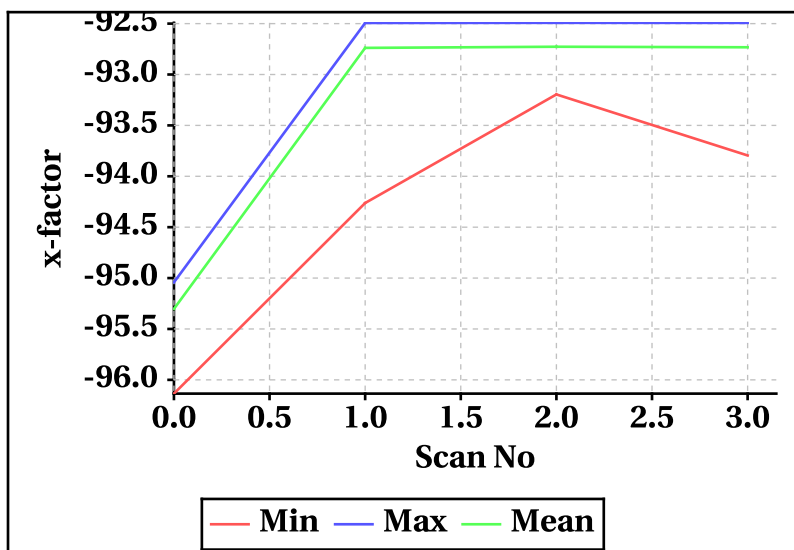
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

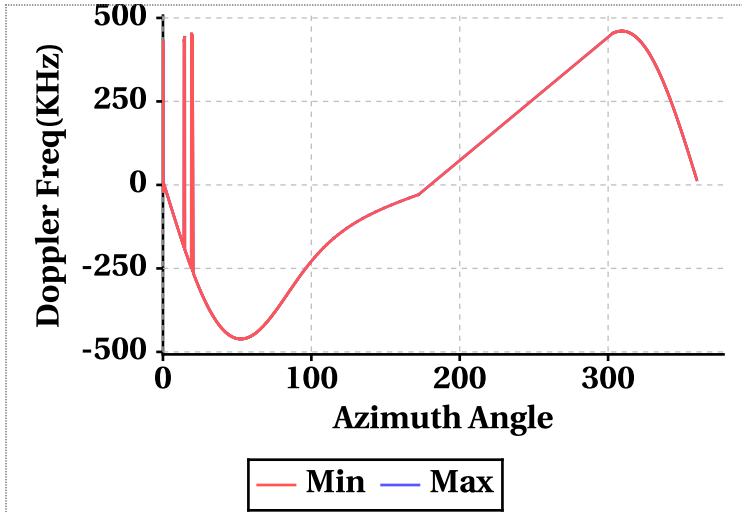


# Doppler Frequency Variation

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

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-461.32	-516.92
<b>Max</b>	460.68	516.36

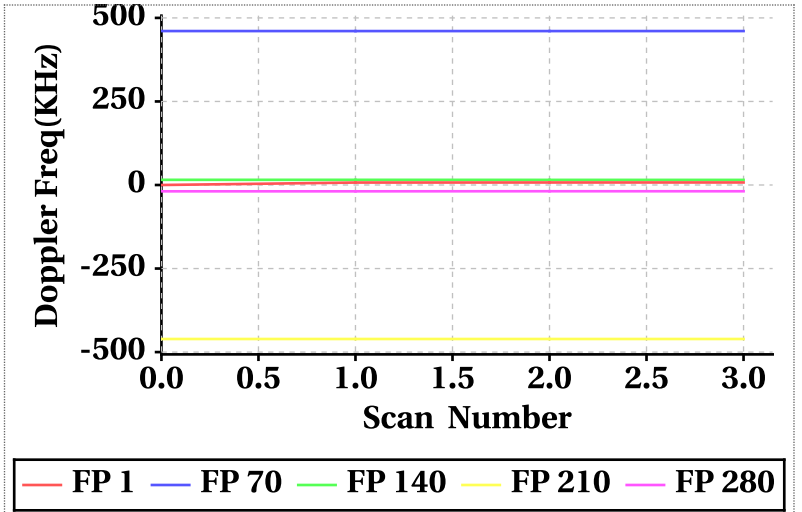
**Footprint wise Doppler frequency variation Inner Beam (HH)**



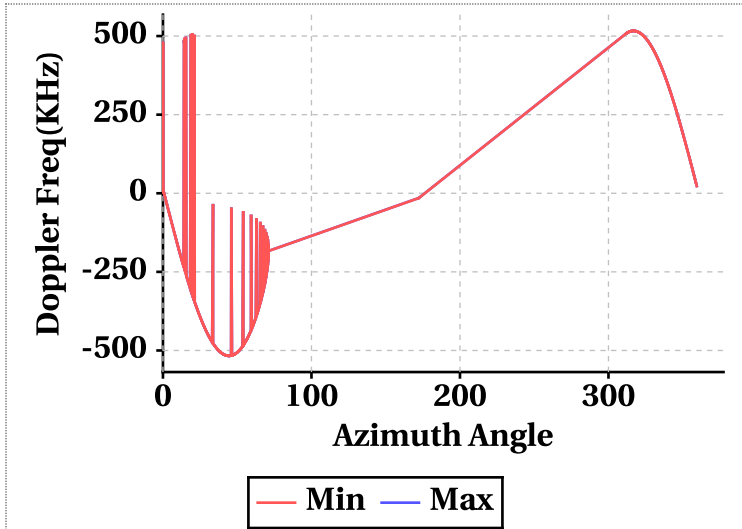
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	0.00	7.56	5.60	-18.74	2.90	-2.59
Doppler_70	460.58	460.60	460.59	516.12	516.14	516.12
Doppler_140	15.26	15.46	15.37	11.32	11.56	11.44
Doppler_210	-460.78	-460.78	-460.78	-516.58	-516.58	-516.58
Doppler_280	-18.94	-18.70	-18.82	-15.32	-15.04	-15.18

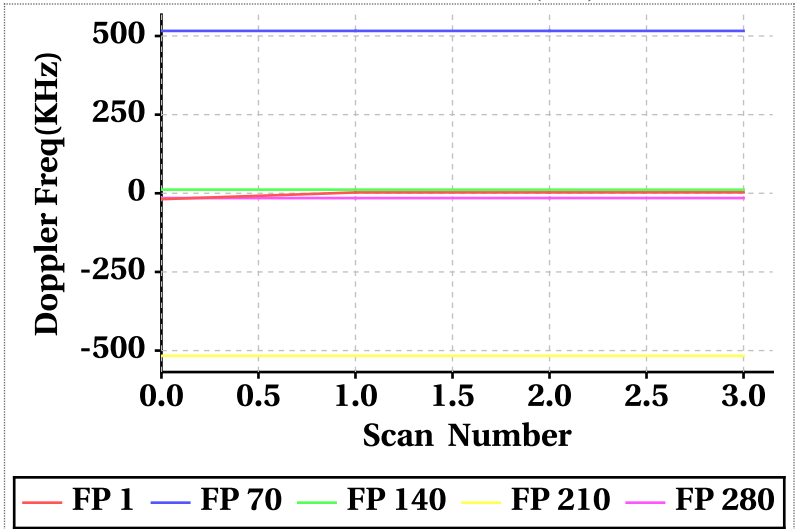
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

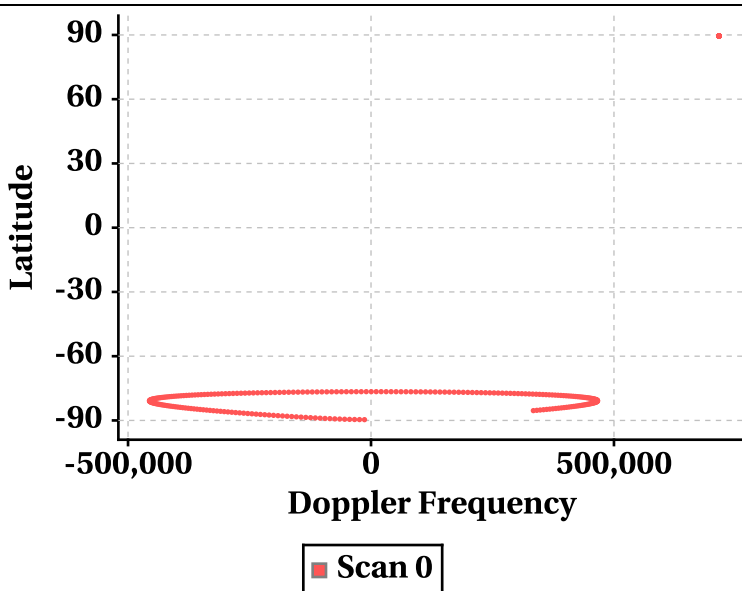


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

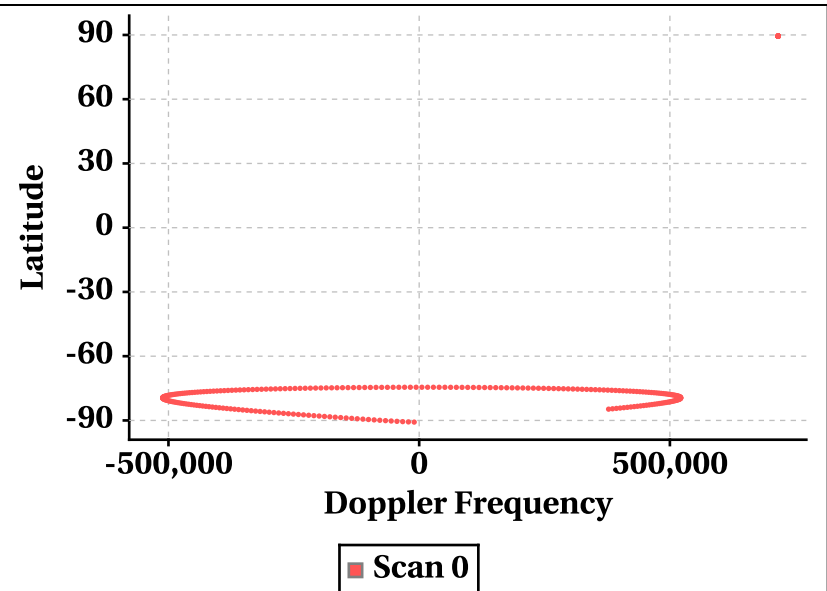


# Latitude Vs Doppler Frequency

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



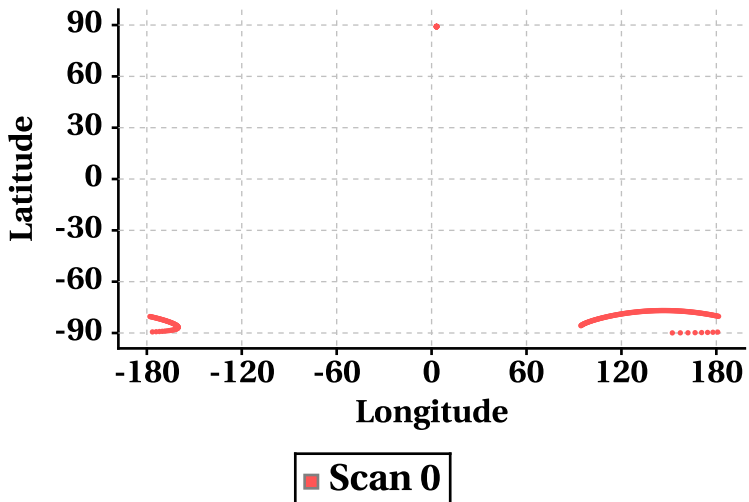
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



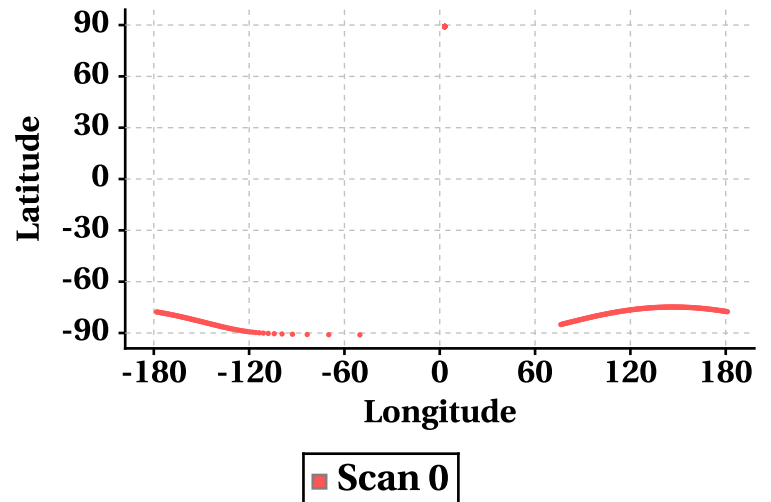
# Parameter as a function of Latitude

## Latitude Vs Longitude

### Scan Trace [Inner Beam(HH)]

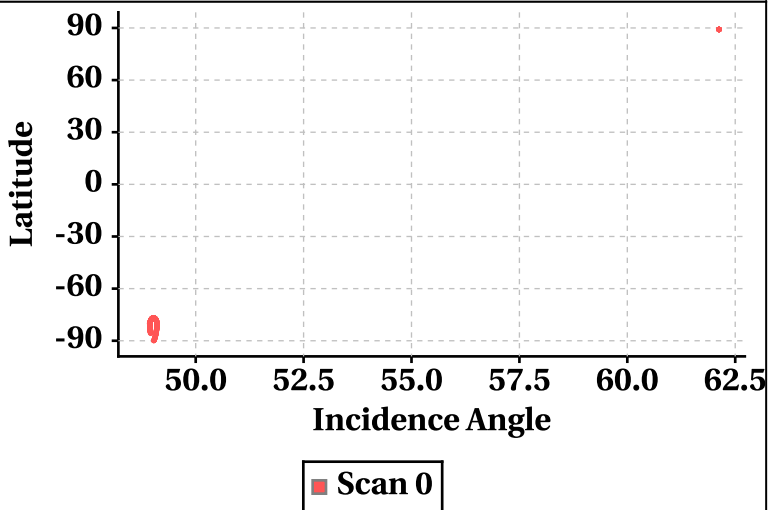


### Scan Trace [Outer Beam (VV)]

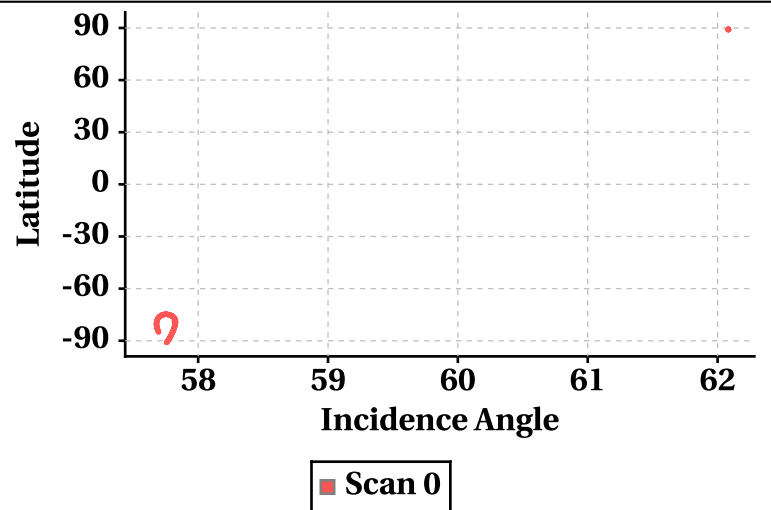


## Latitude Vs Incidence Angle

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

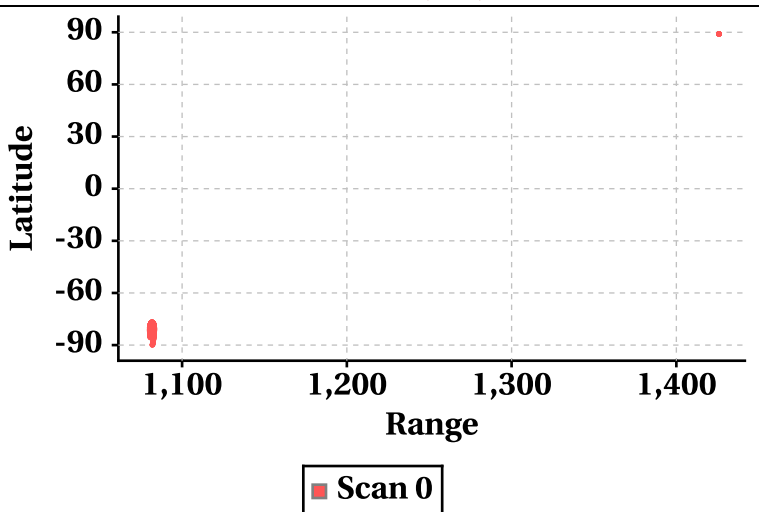


### Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

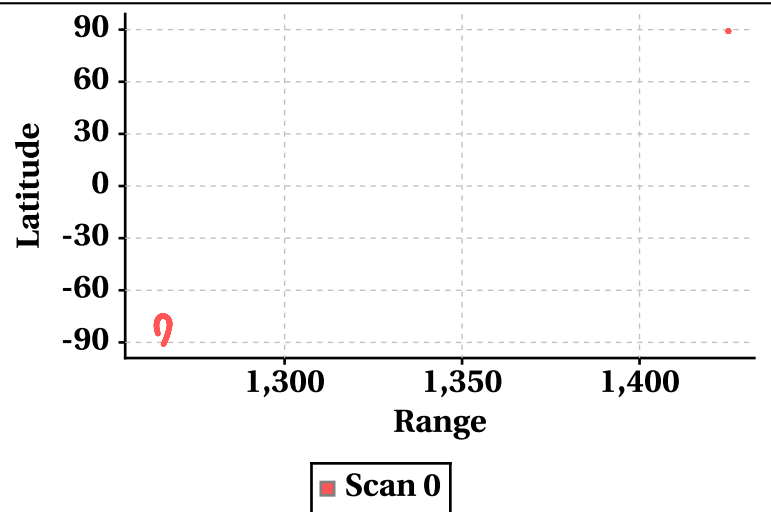


## Latitude Vs Range

### Range at Scan Interval of 200 [Inner Beam(HH)]



### Range at Scan Interval of 200 [Outer Beam(VV)]



# Variation in Orbit and Attitude Parameters

