

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

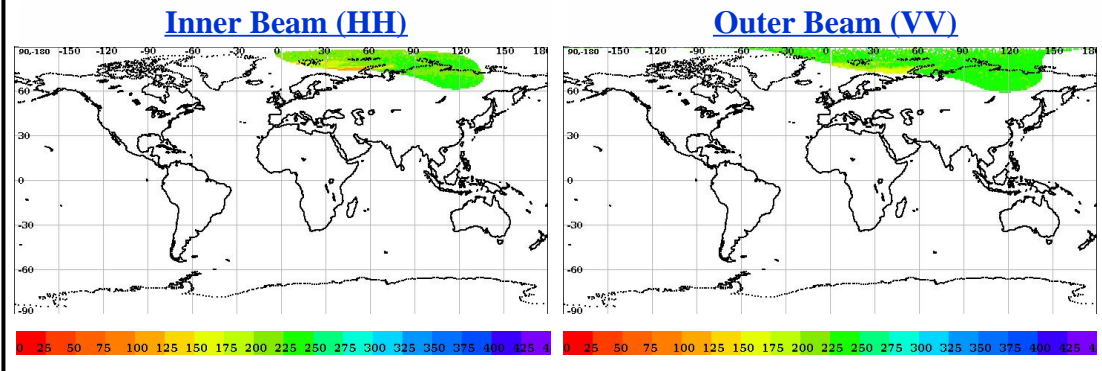
Doppler Variation (Across/Along Track for HH/VV Beam)

L1B Parameter as a function of Latitude

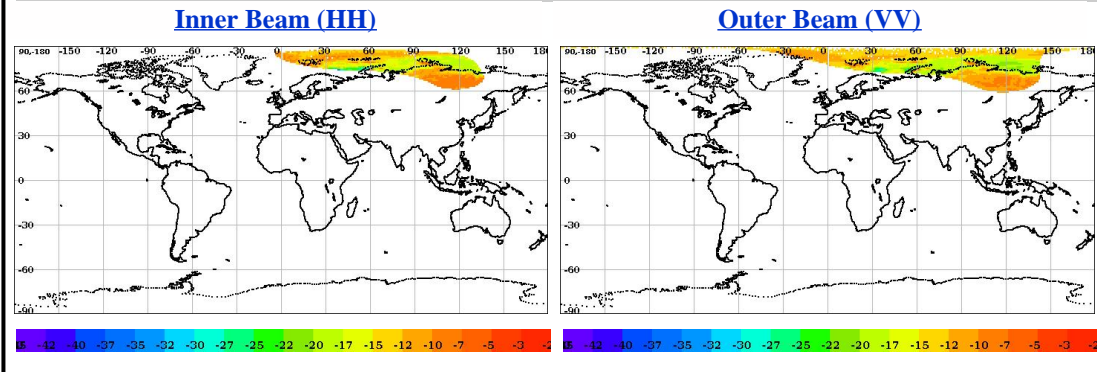
Half Orbit OAT Behaviour

Satellite Id	ScatSat-1	Start Orbit	2121	Total Scans	109
Sensor Name	Scatterometer	End Orbit	2122	No of Inner FootPrints	281
Processor Version	1.1.1	Rev. Number	02121_02122	No Of Outer FootPrints	282
Half Orbit Direction	SN	Data Production Date	20-02-2017	No. Of Inner Slices	9
Equator Crossing Date	19-02-2017	Equator Crossing Time	11:28:36.000	No Of Outer Slices	15

Brightness Temprature(k) Footprint trace



Sigma0(dB) Footprint trace

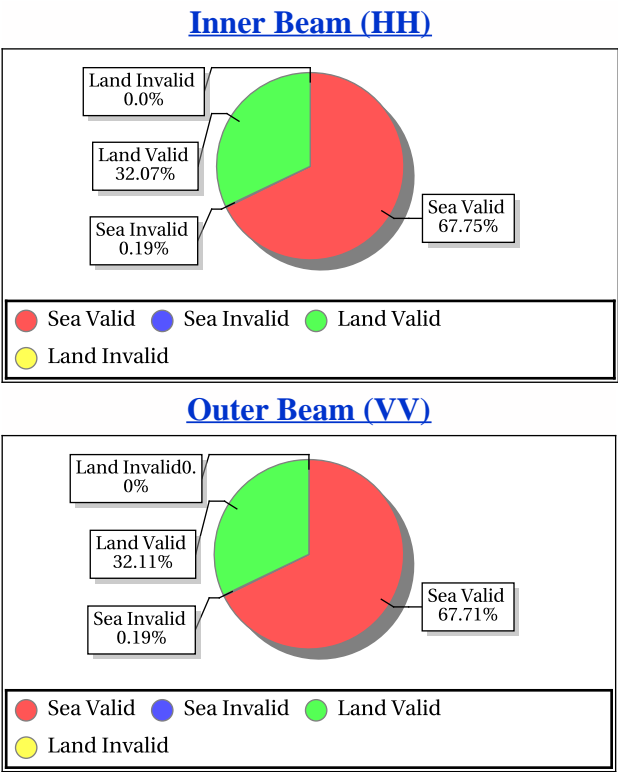


Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.19	0.19
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(%)	0.00	0.00
Noise samples for blending Saturated	0.0	0.0
Count samp. for interpol. saturated (%)	0.00	0.00
Sigma0<lower bound (-96bB) (%)	0.0	0.0
Sigma0>upper bound (0 dB) (%)	0.00	0.00
SNR <-65 dB (%)	100.0	0.0

\*DP Format Document

Sigma-0 Quality Flag Statistics for Inner/Outer Footprints



## 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>	0.10	0.29	0.11	0.000	0.10	1.02	0.11	0.009	0.10	0.10	0.10	0.000	0.10	0.10	0.10	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	0.02	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>	-3.77	19.46	11.93	0.000	-10.44	21.28	13.22	0.000	14.85	25.87	19.44	1.027	14.91	27.30	18.88	2.247

	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>	0.08	0.15	0.09	0.000	0.08	3.97	0.09	0.009	0.08	0.10	0.08	0.000	0.08	0.10	0.08	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>	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.000
<b>SNR</b>	-0.56	14.28	6.66	0.000	-17.67	17.67	8.38	0.000	3.67	17.45	13.94	0.000	3.66	21.12	13.03	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)

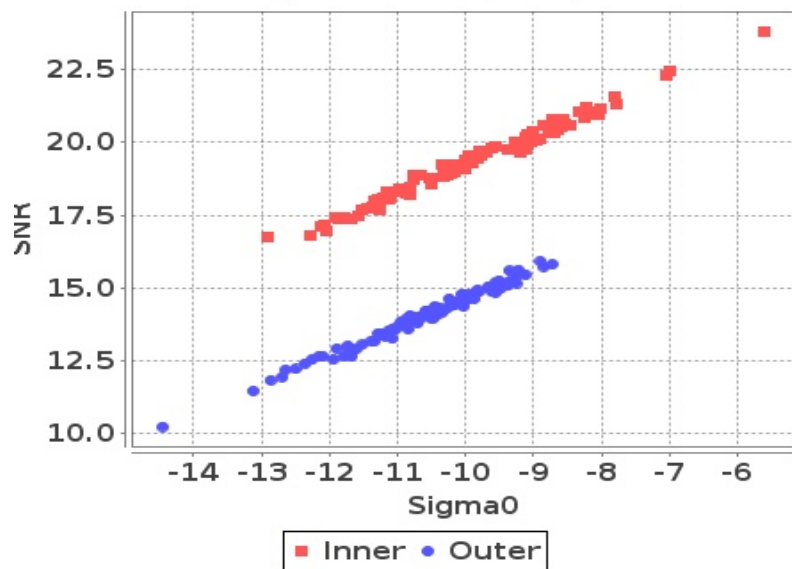
	Inner Beam (VV)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.85	49.17	49.01	0.000	57.74	58.07	57.90	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.7335	1.73	0.41	0.000	0.6177	1.62	0.43	0.000	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1049.19	1055.35	1052.17	0.000	1232.70	1241.62	1236.69	0.000	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-90.81	-90.20	-90.40	0.000	-92.53	-92.22	-92.41	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.45	15.97	15.64	0.000	2.77	31.46	20.68	5.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	19.50	20.10	19.60	0.000	19.20	20.25	19.56	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
									<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Normal</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Deviations</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black;"></span> Alarming</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> High Errors</li> </ul>		



# Sigma0 Behaviour (Sigma0 Vs SNR)

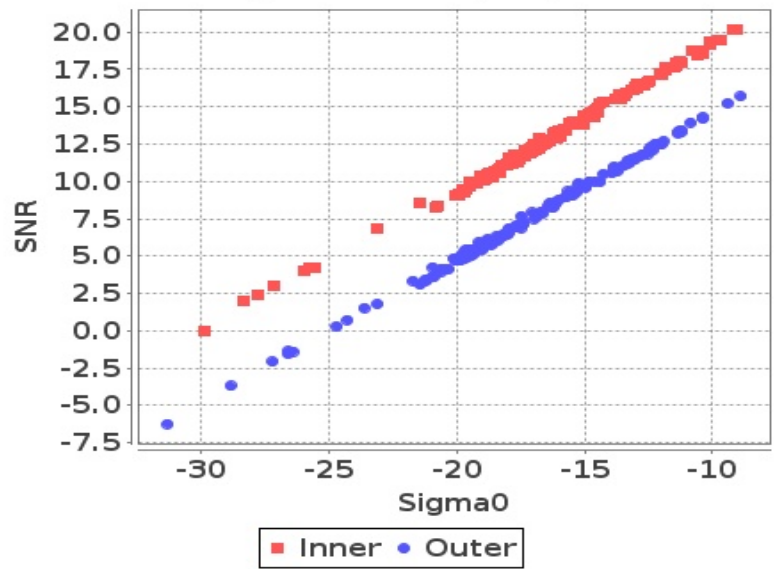
Footprint-Land

Sigma0 Vs SNR (Land)



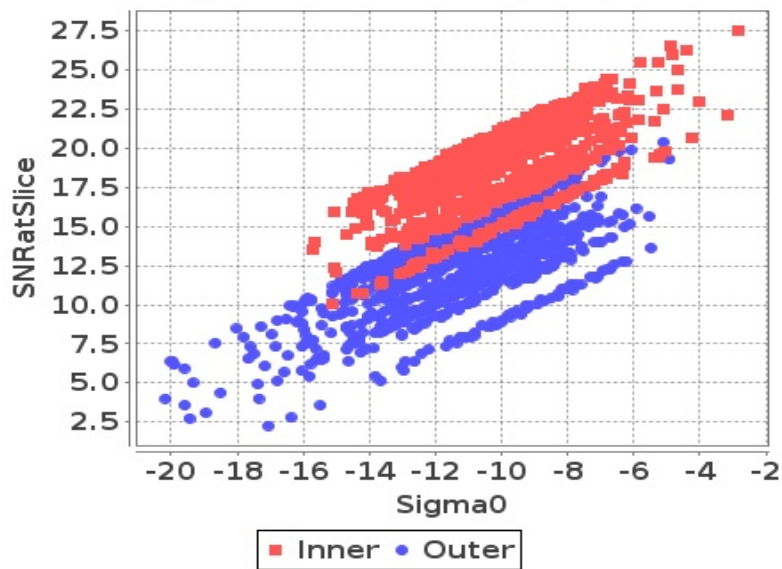
Footprint-Sea

Sigma0 Vs SNR (Sea)



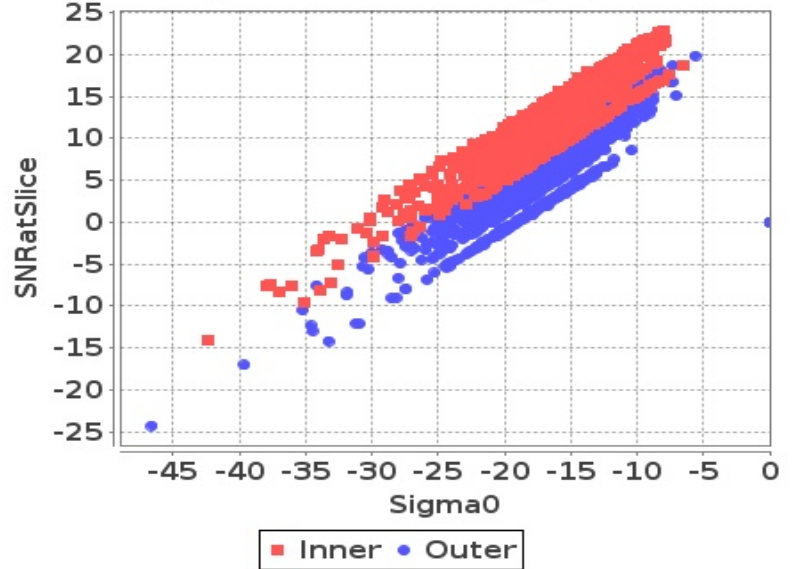
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

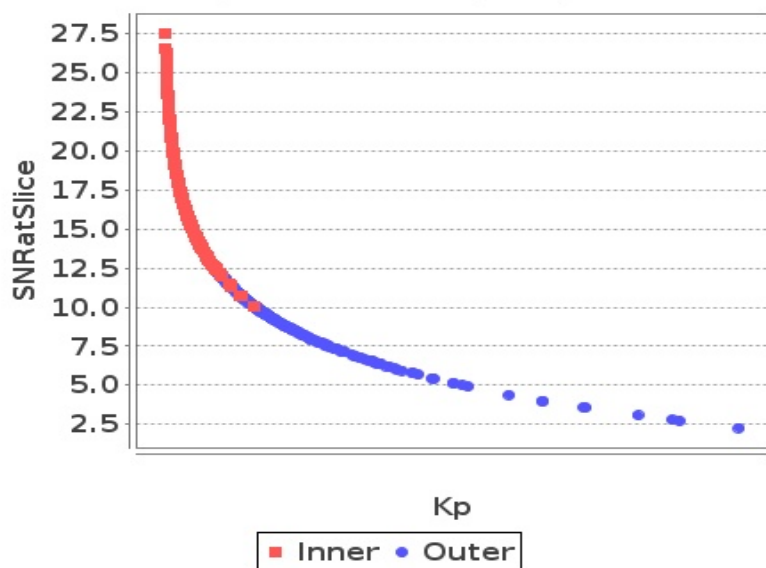
Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

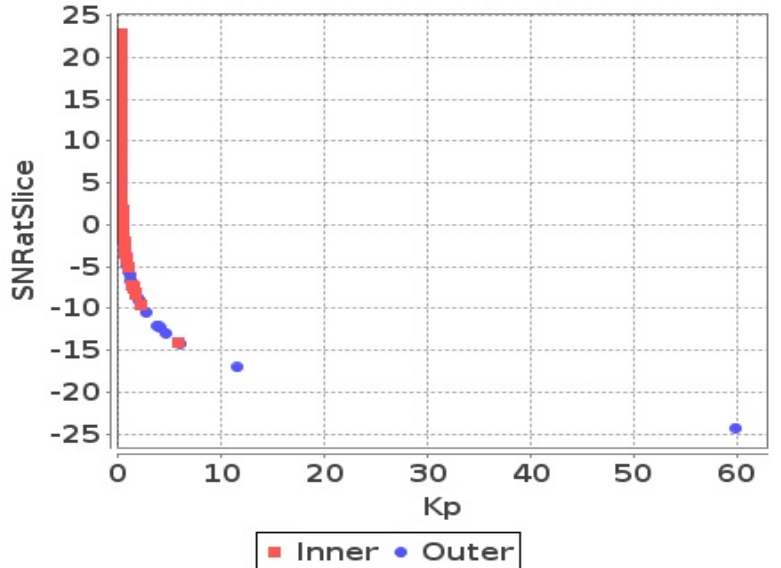
Slice

Kp Vs SNRatSlice (Land)



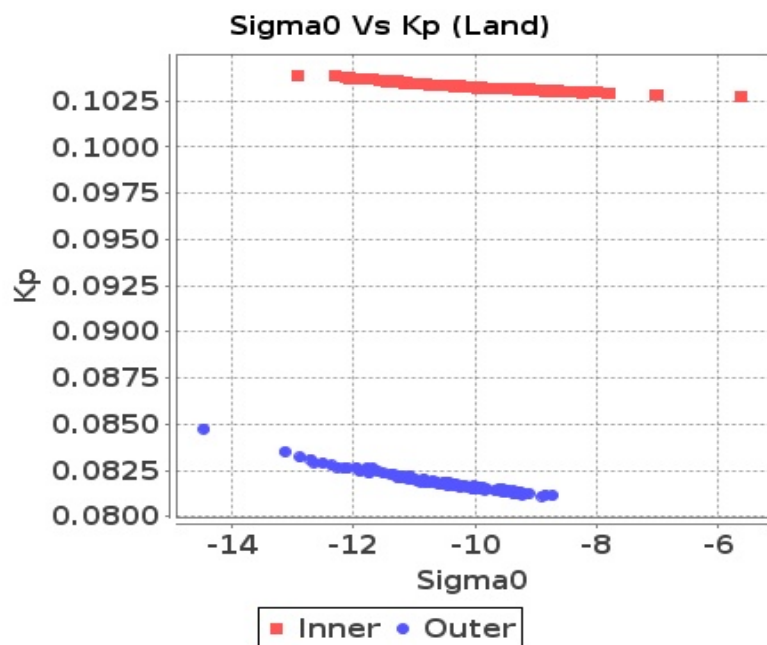
Slice

Kp Vs SNRatSlice (Sea)

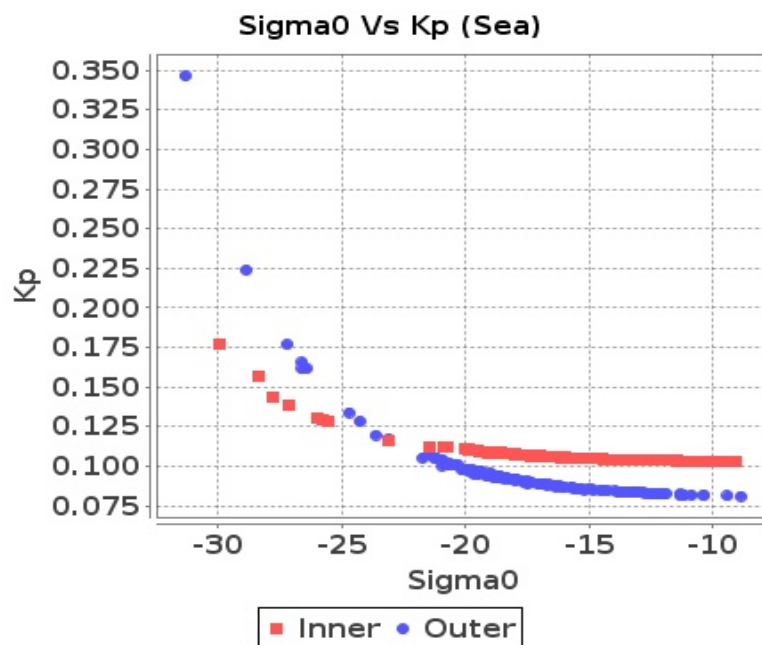


# Sigma0 Behaviour(Sigma0 Vs Kp)

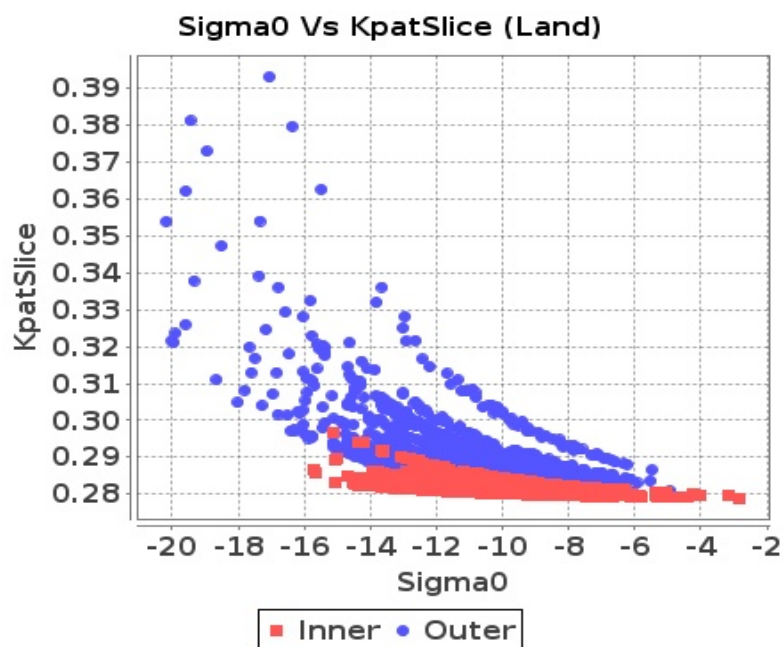
## Footprint-Land



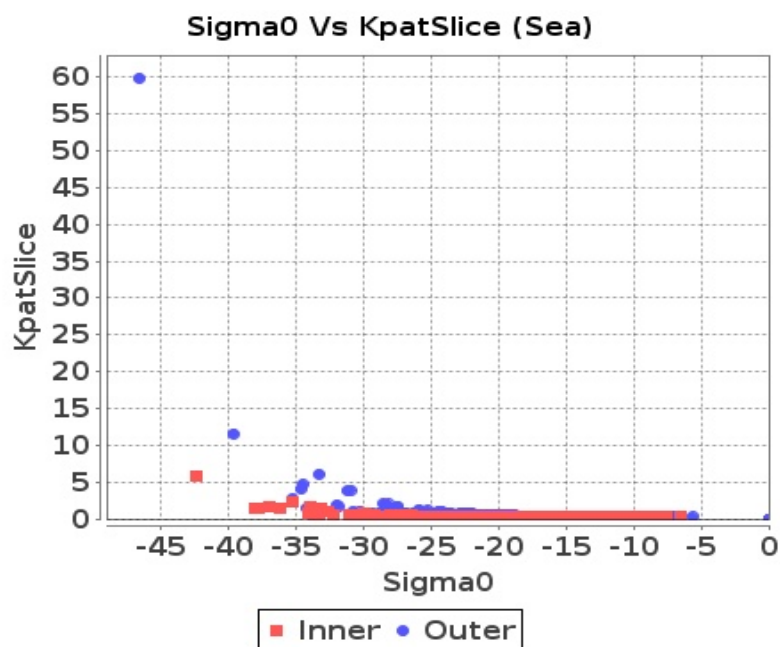
## Footprint-Sea



## Slice-Land



## Slice-Sea



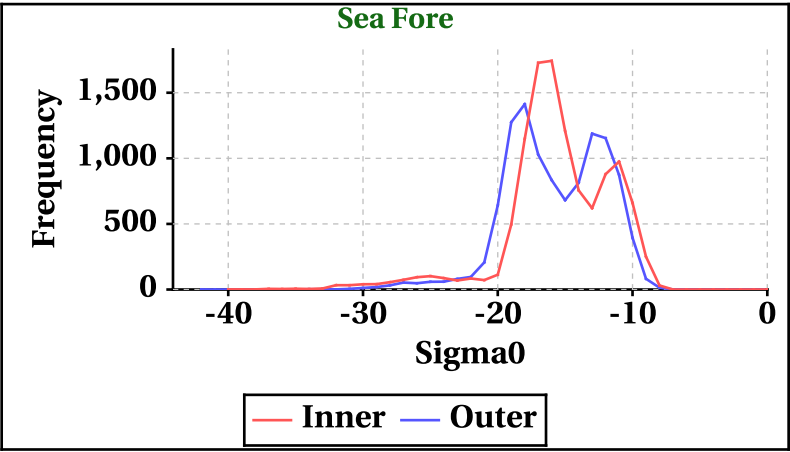
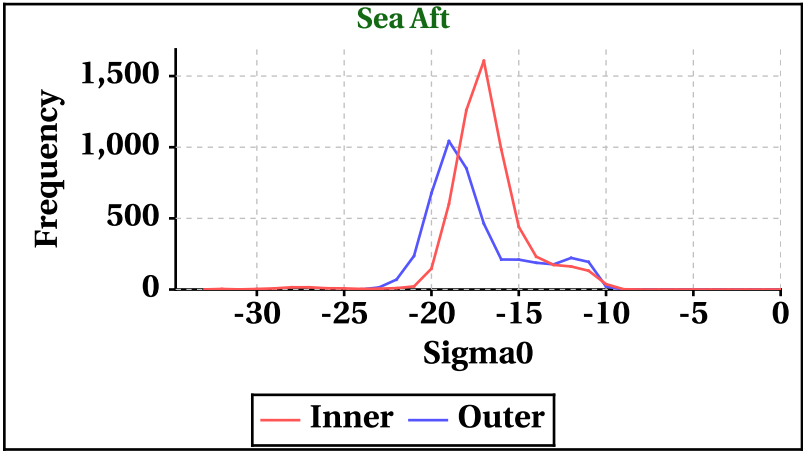
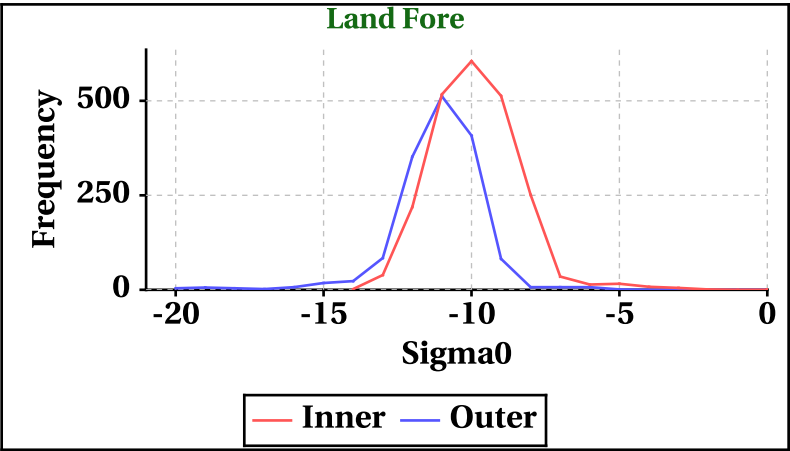
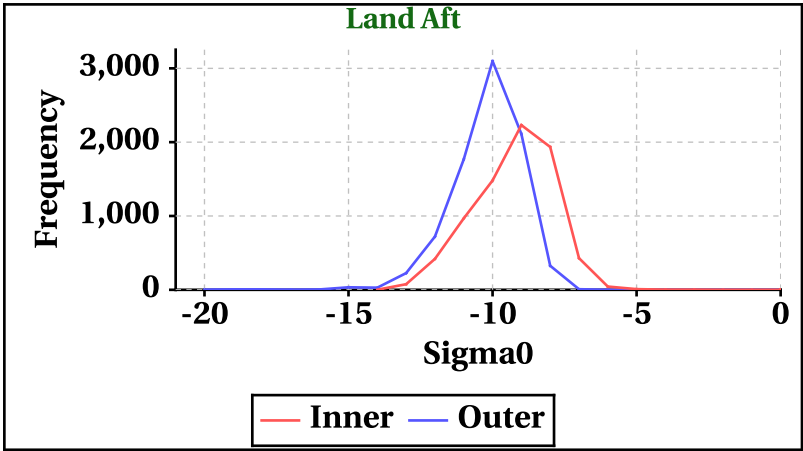


Dynamic Range (Data Histograms)

Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-14	-14	-33	-40
Max	0	0	0	0

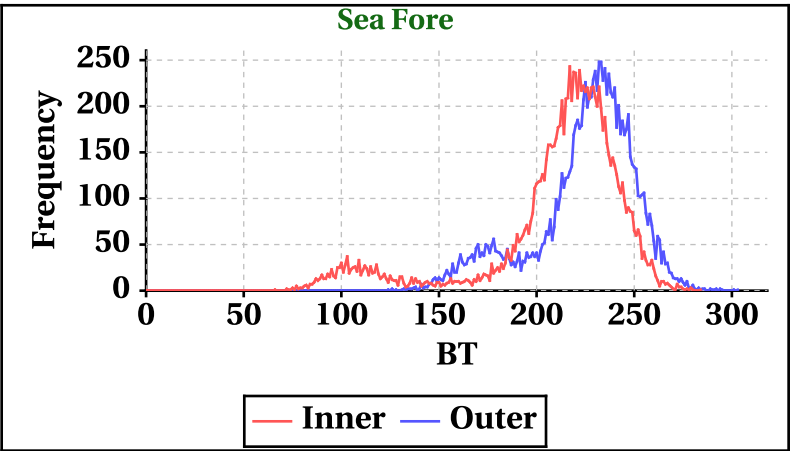
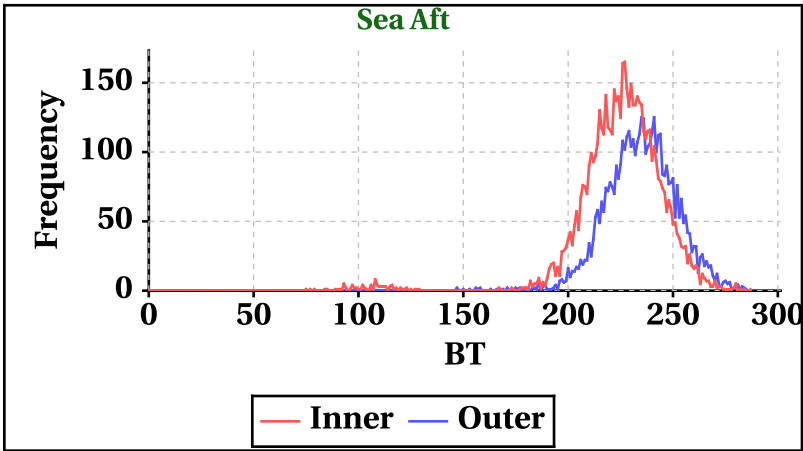
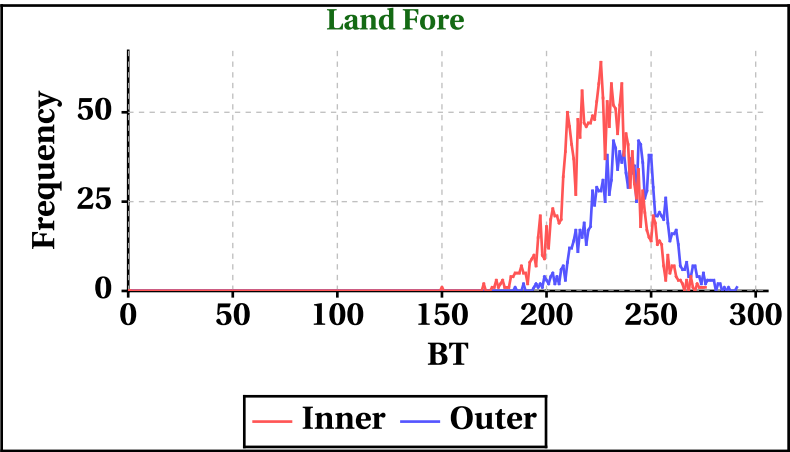
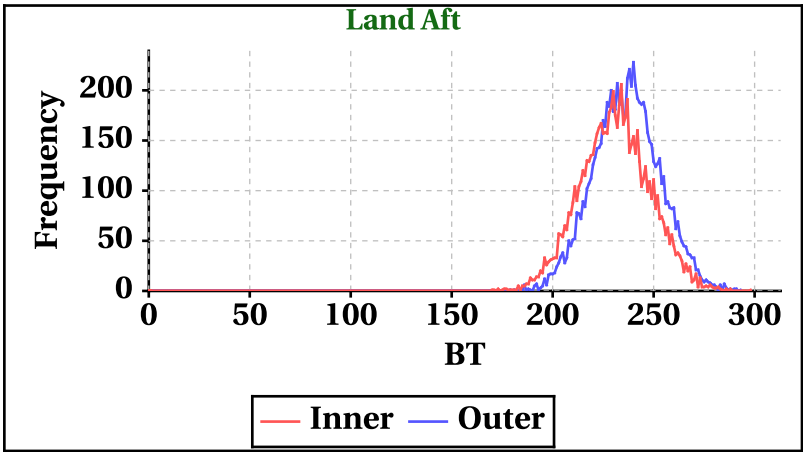
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-20	-20	-24	-42
Max	0	0	0	0



Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	298	276	287	284

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	293	291	285	303

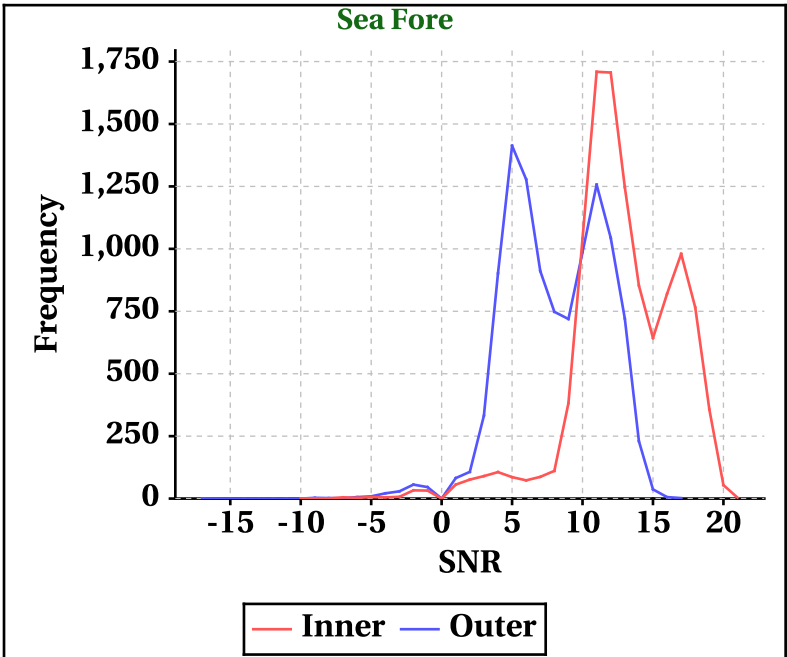
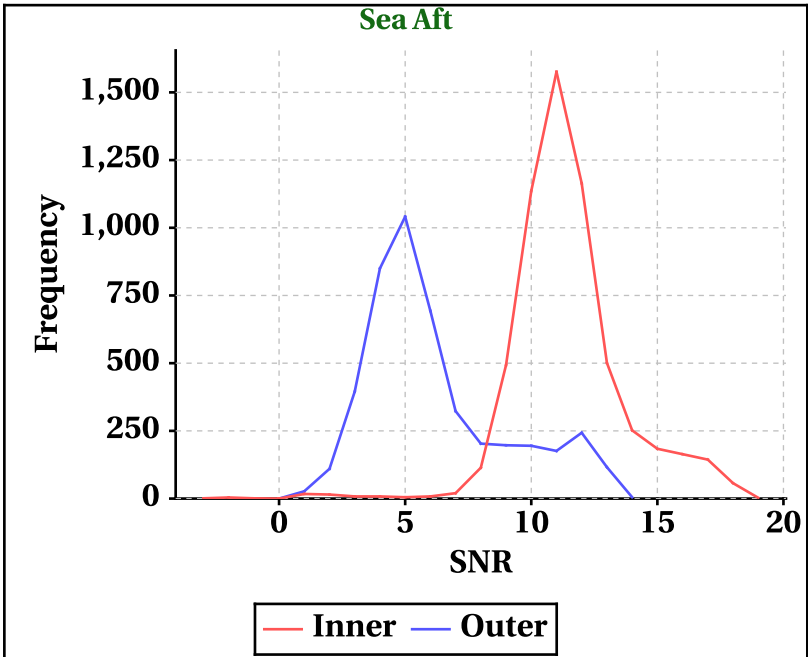
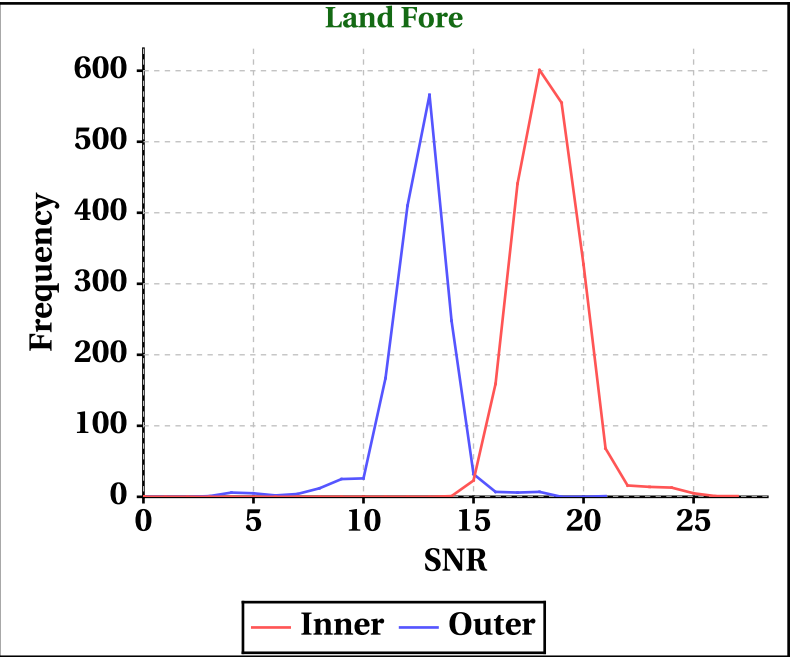
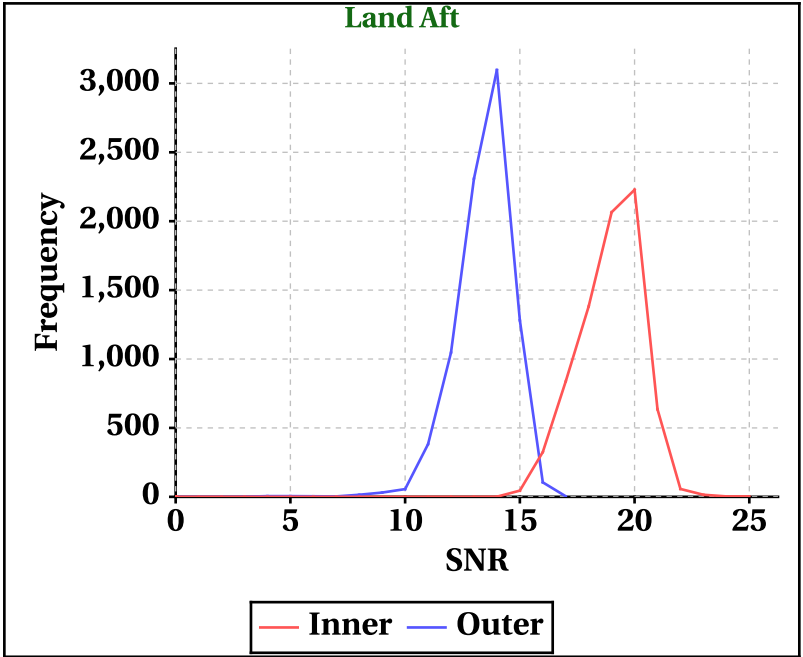


Dynamic Range (Data Histograms)

SNR(dBm)

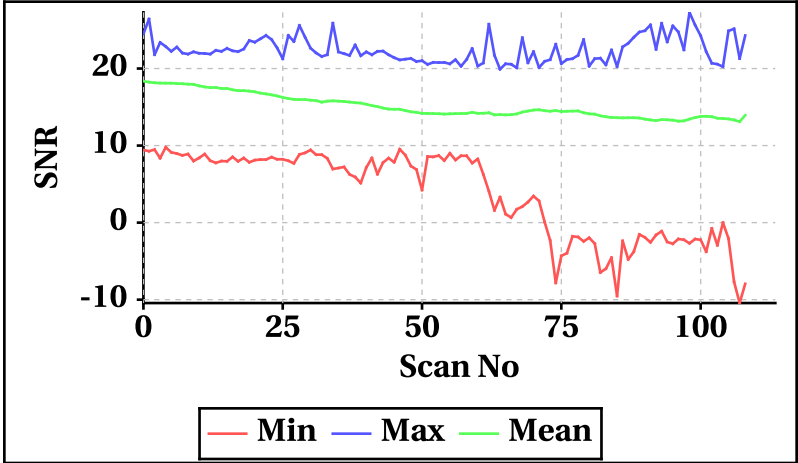
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-3	-10
Max	25	27	19	21

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	-17
Max	17	21	14	17

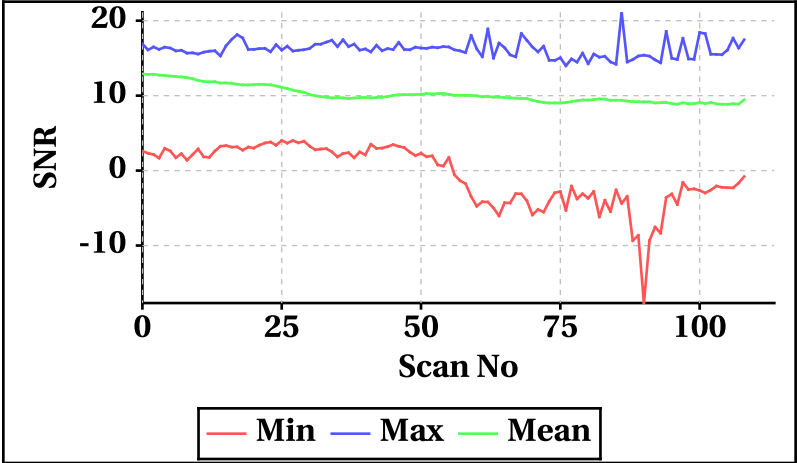


# Orbit-wise behaviour of SNR

Inner Beam (HH)

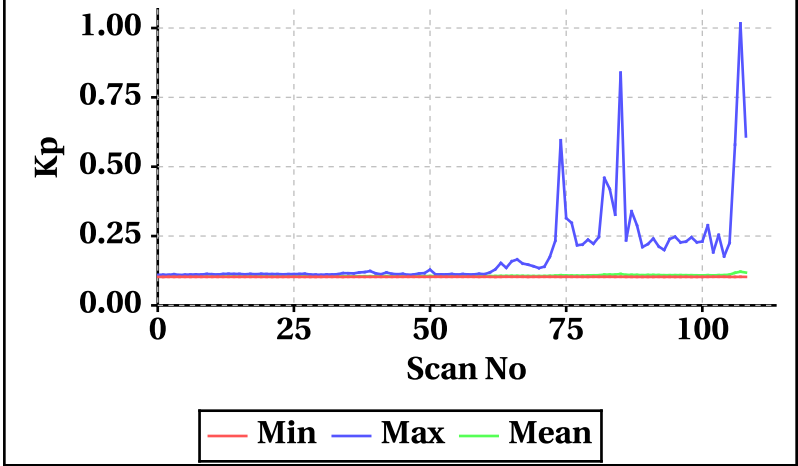


Outer Beam(VV)

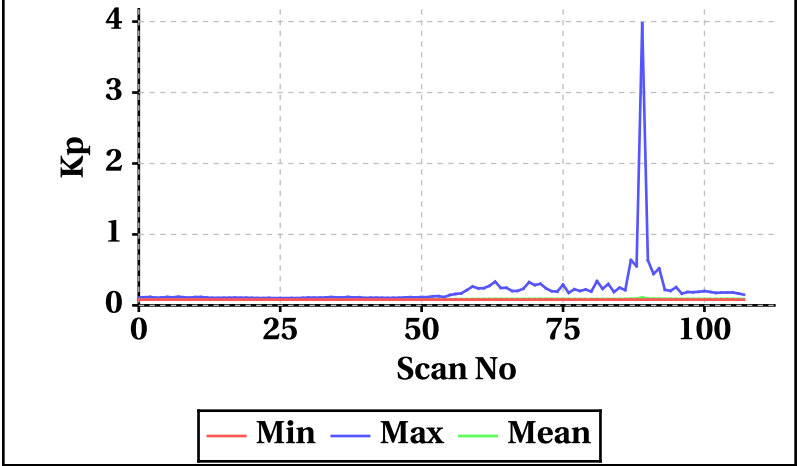


# Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

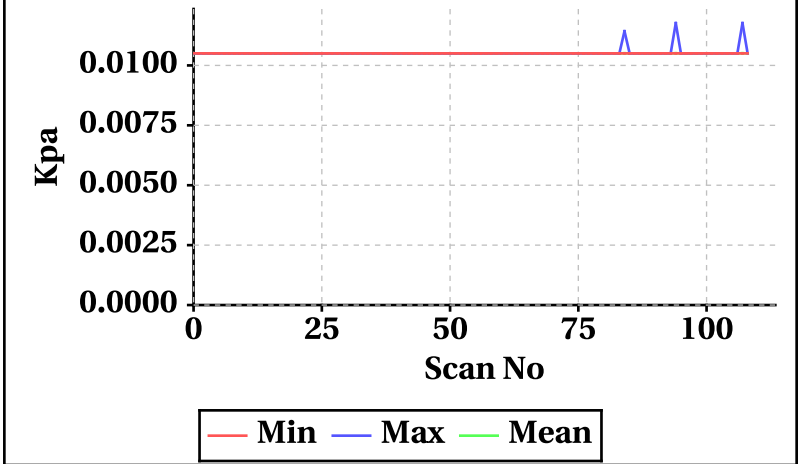
Inner Beam(HH)



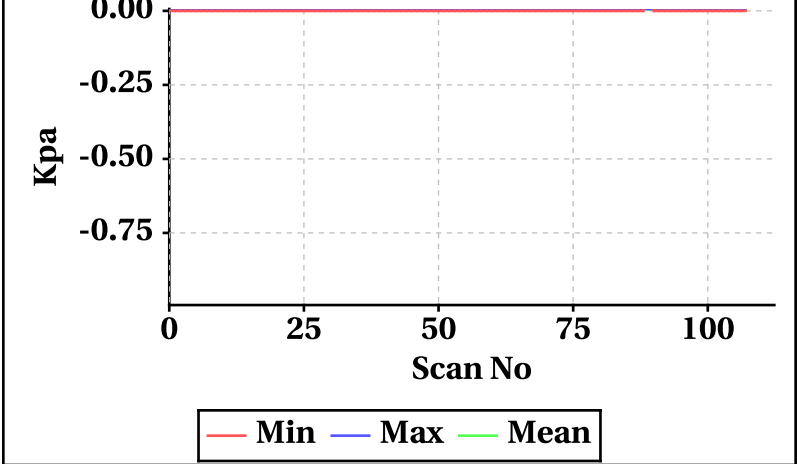
Outer Beam(VV)



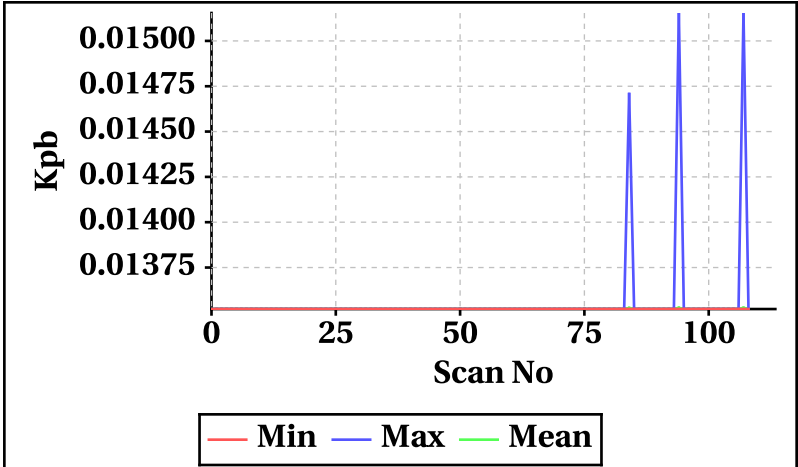
Inner Beam(HH)



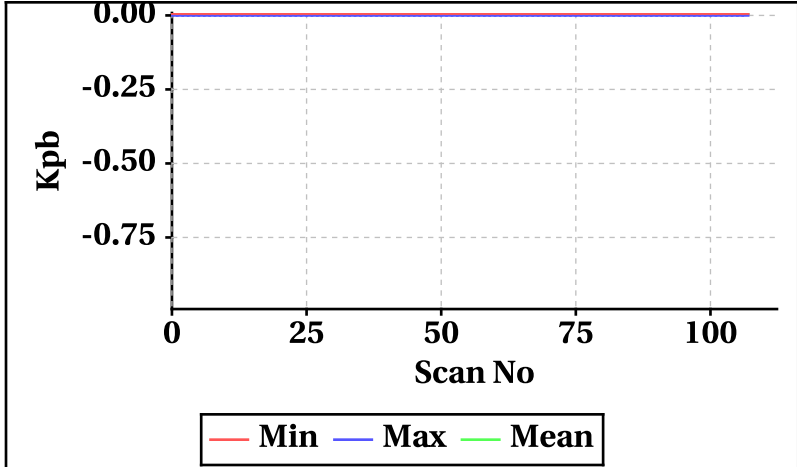
Outer Beam(VV)



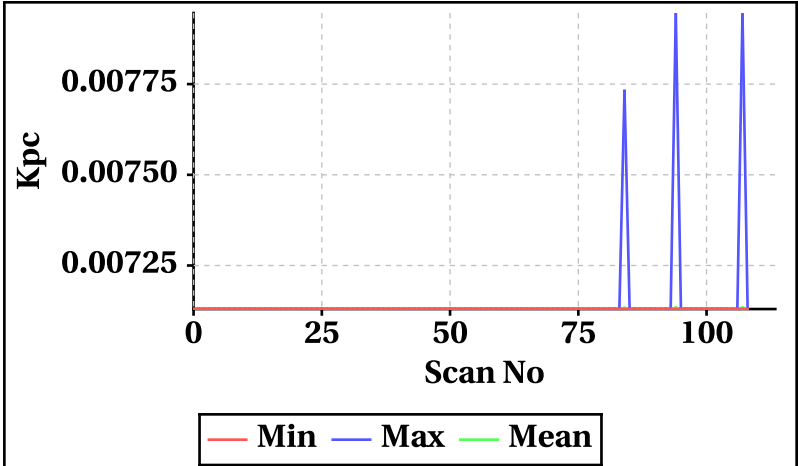
Inner Beam(HH)



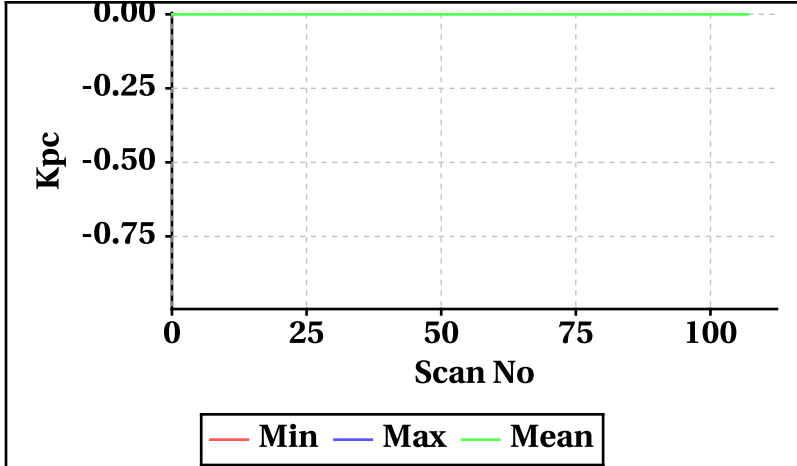
Outer Beam(VV)



Inner Beam(HH)

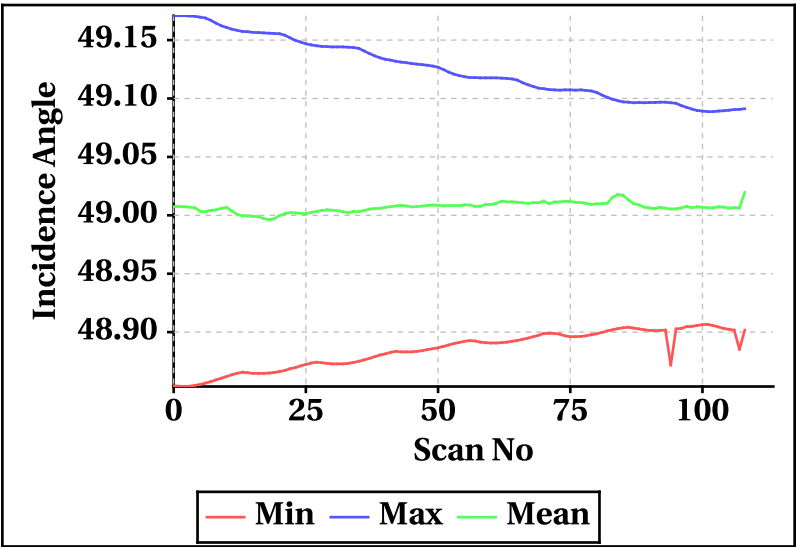


Outer Beam(VV)

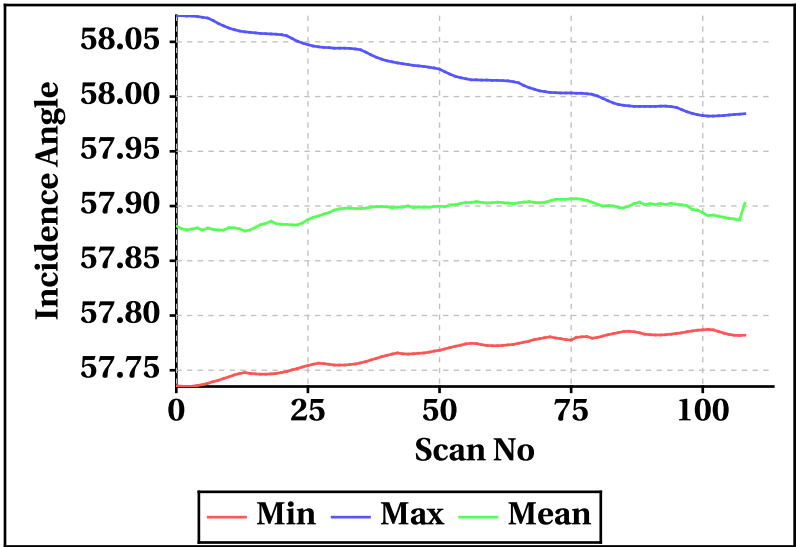


Orbt-wise behaviour of Incidence,Azimuth,Range,X-Factor

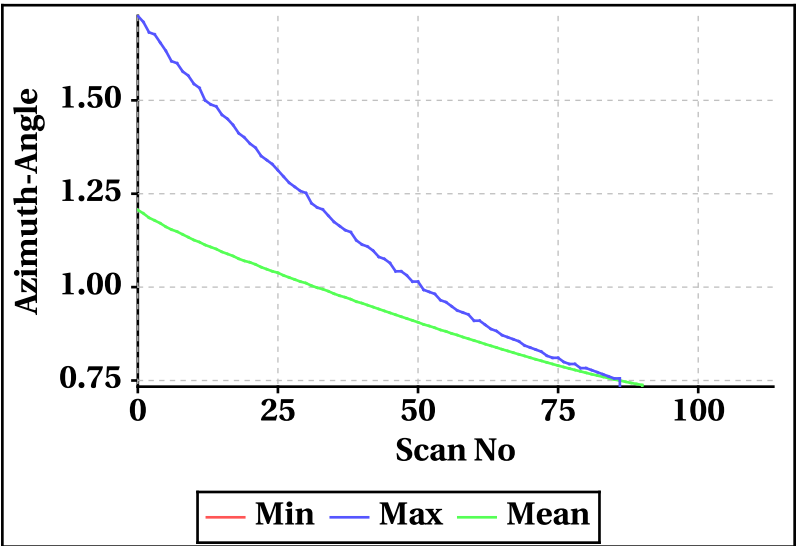
Inner Beam (HH)



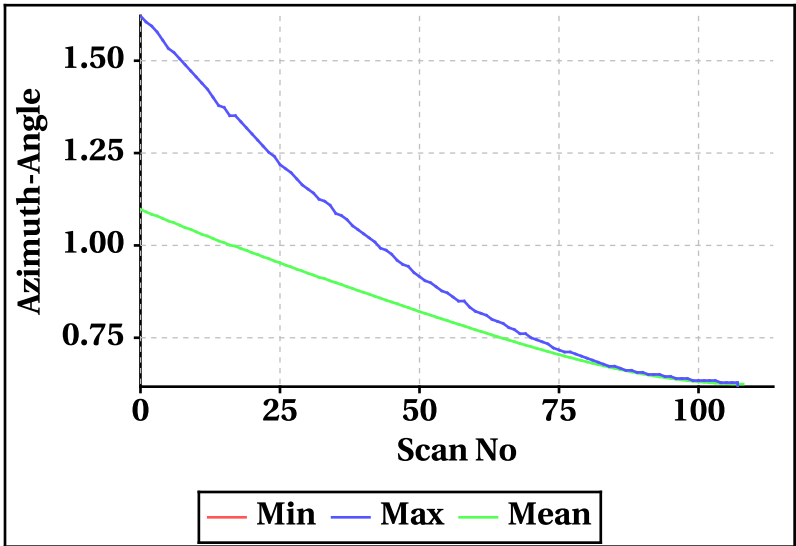
Outer Beam(VV)



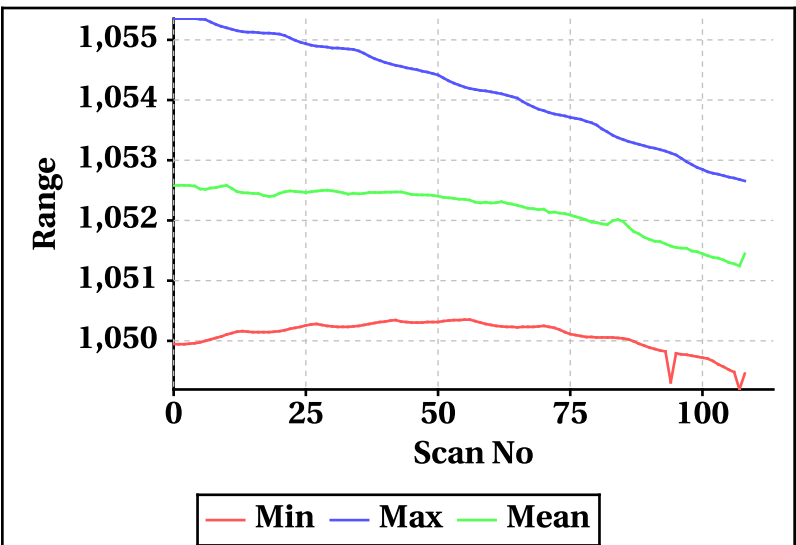
Inner Beam (HH)



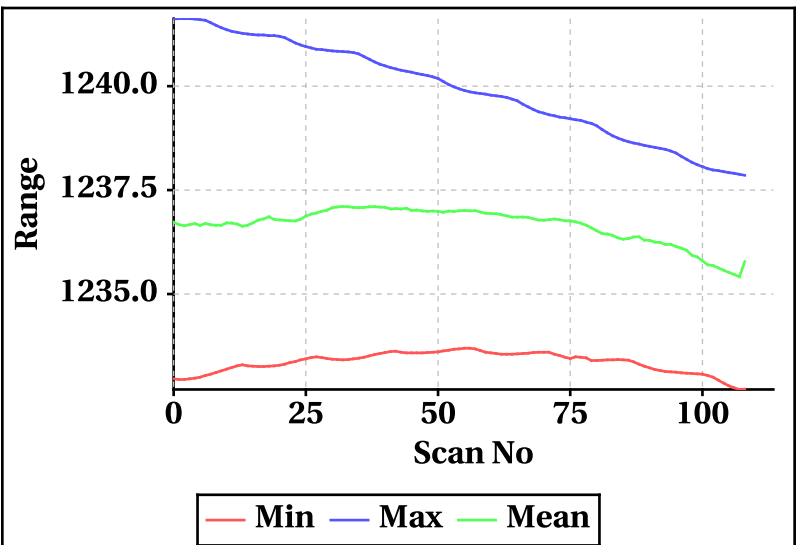
Outer Beam(VV)



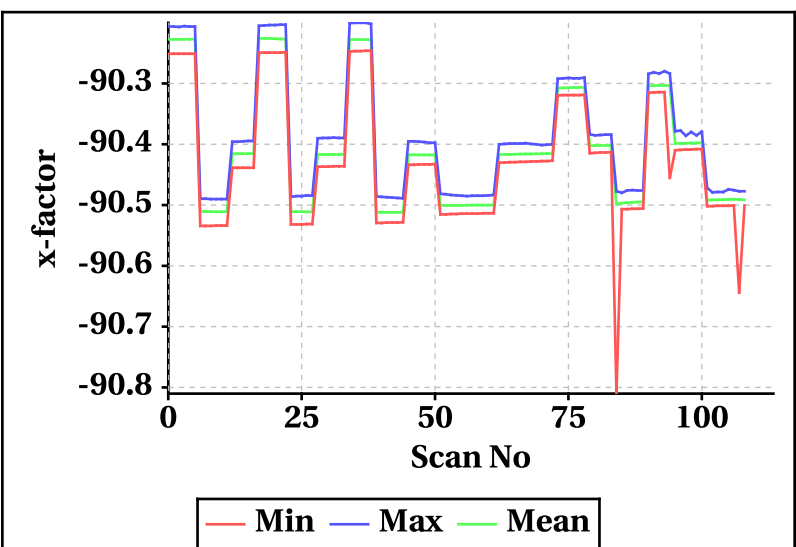
Inner Beam (HH)



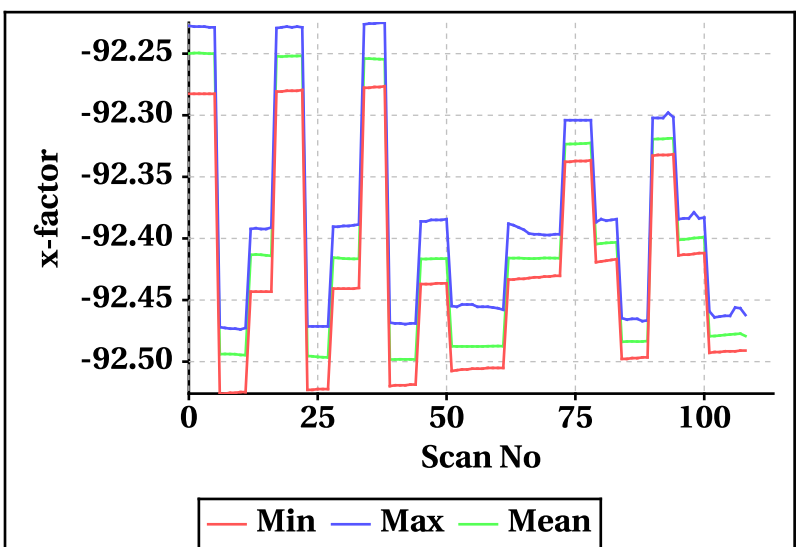
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



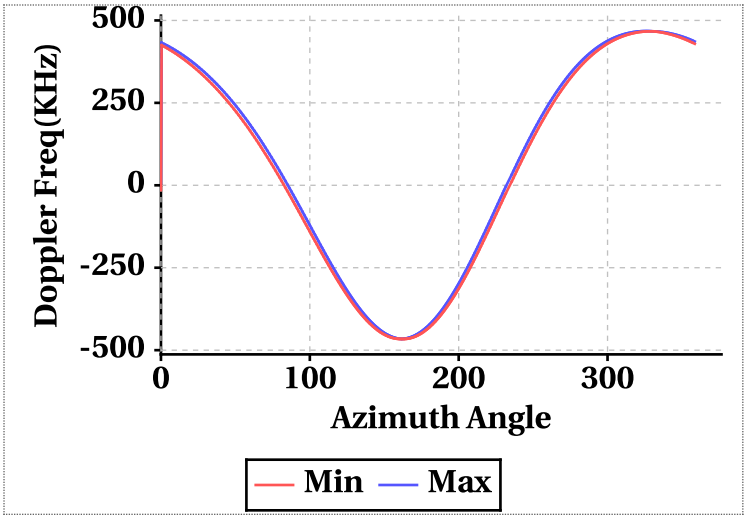


Doppler Frequency Variation

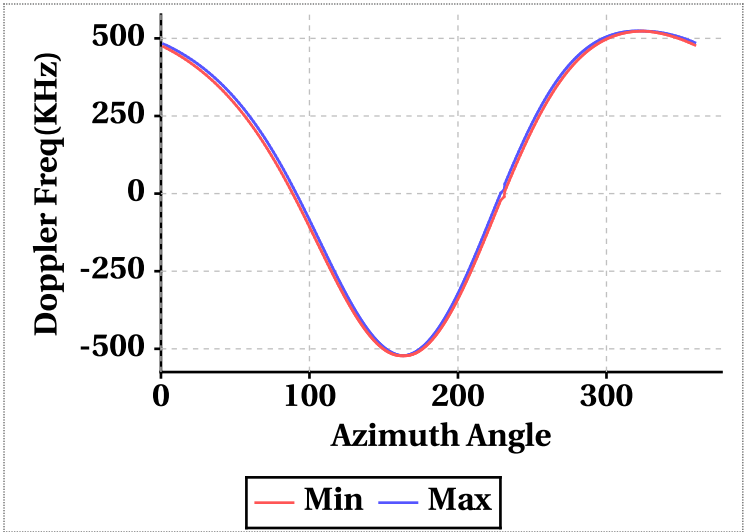
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-466.12	-522.50
Max	467.80	524.06

Footprint wise Doopler frequency variation Inner Beam (HH)



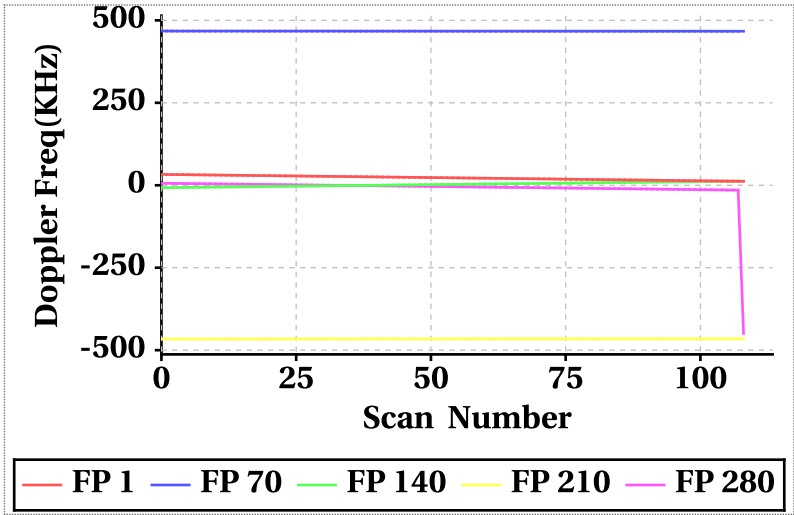
Footprint wise Doopler frequency variation Outer Beam (VV)



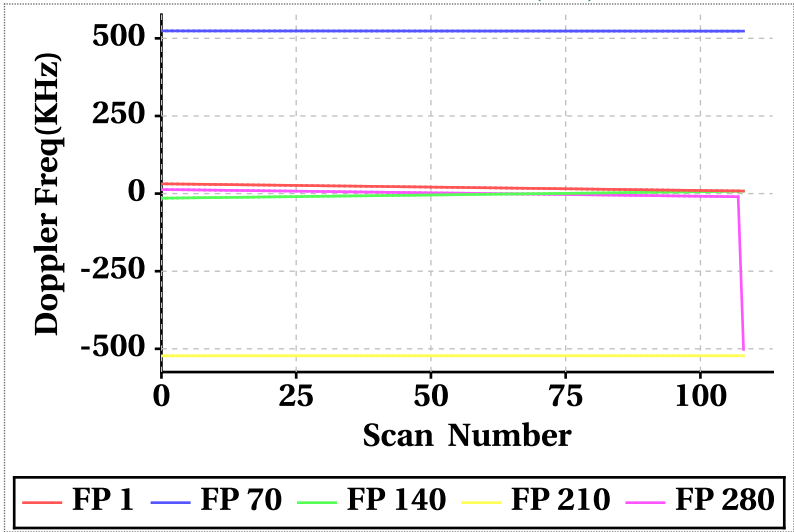
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	12.02	32.84	22.54	8.22	31.48	19.98
Doppler_70	467.06	467.58	467.32	523.24	523.94	523.59
Doppler_140	-7.28	12.92	2.72	-14.82	7.86	-3.61
Doppler_210	-466.06	-465.72	-465.89	-522.46	-522.28	-522.37
Doppler_280	-449.18	6.00	-8.30	-501.74	13.02	-3.01

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

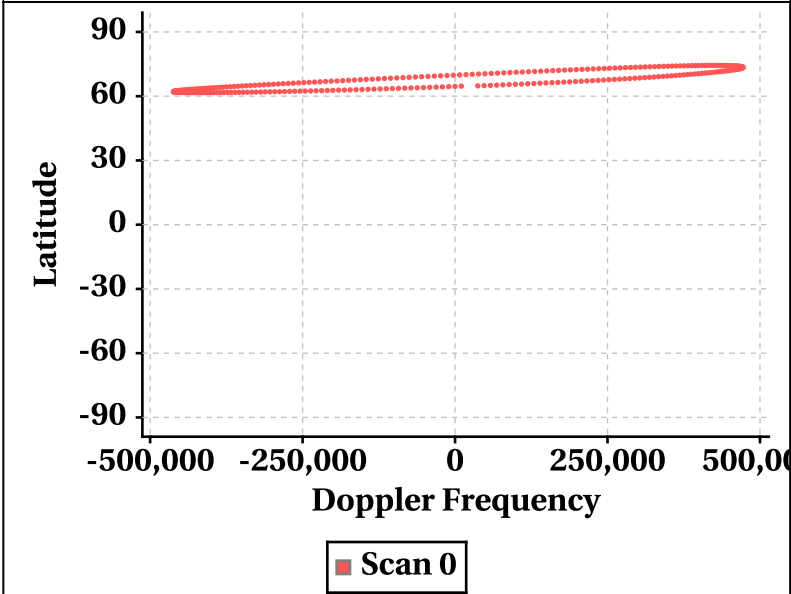


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

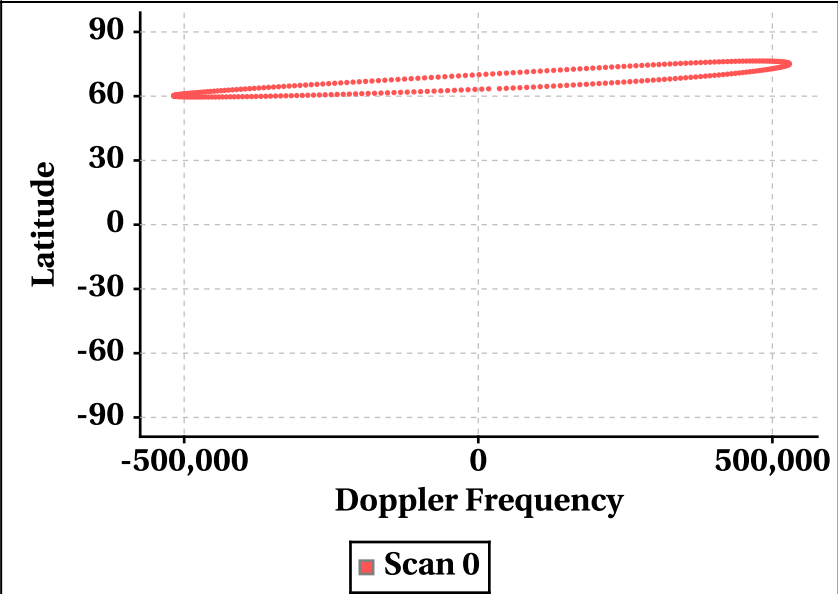


Latitude Vs Doppler Frequency

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



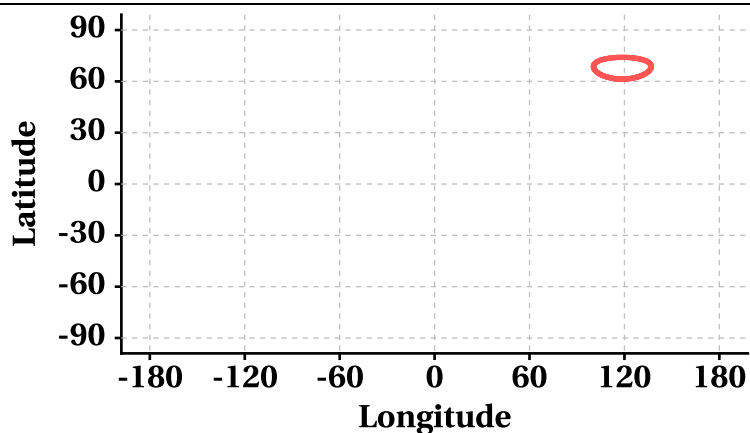
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



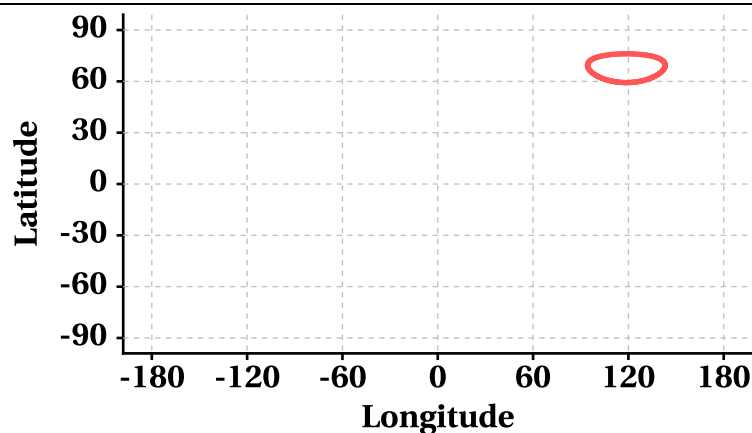
# Parameter as a function of Latitude

## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]

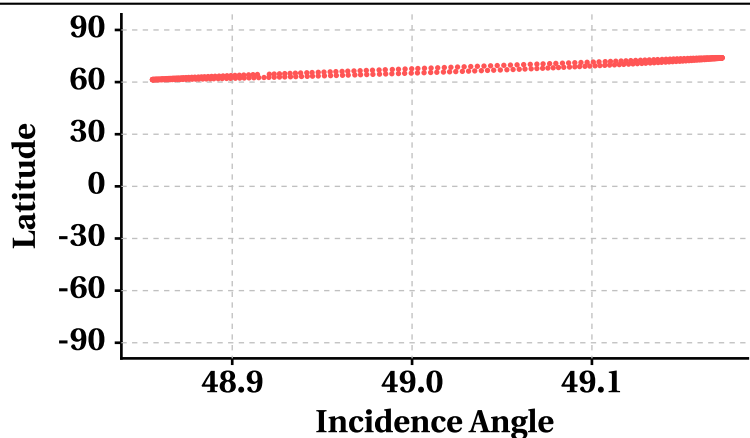


Scan Trace [Outer Beam (VV)]

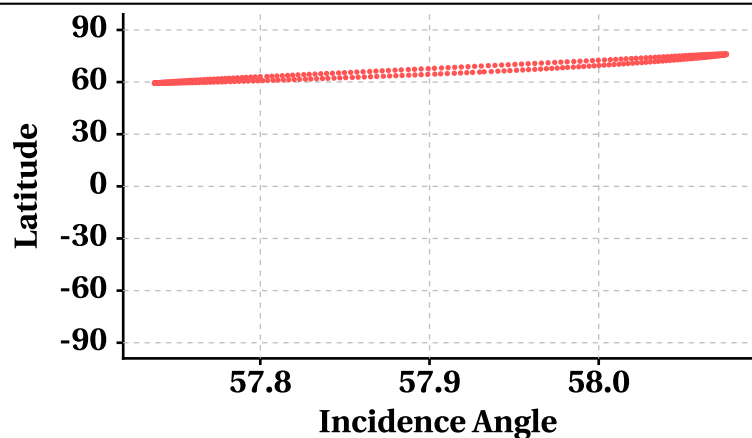


## Latitude Vs Incidence Angle

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

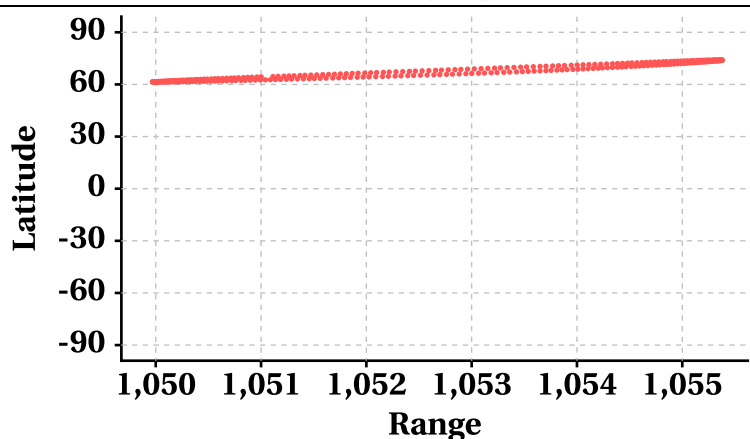


Incidence Angle at Scan Interval of 200  
[Outer Beam (VV)]

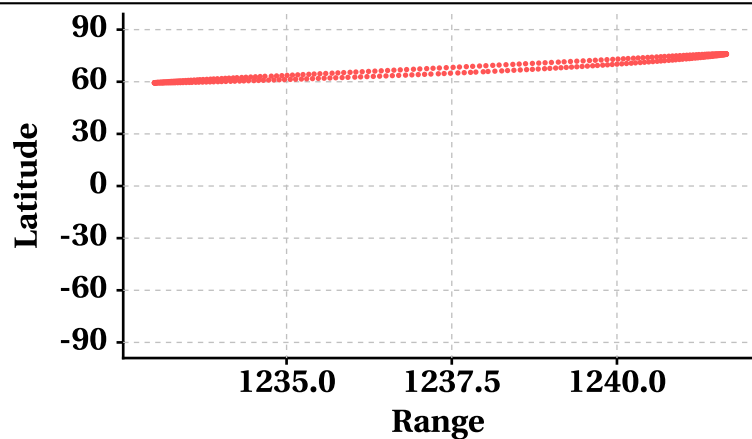


## Latitude Vs Range

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



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



Variation in Orbit and Attitude Parameters

