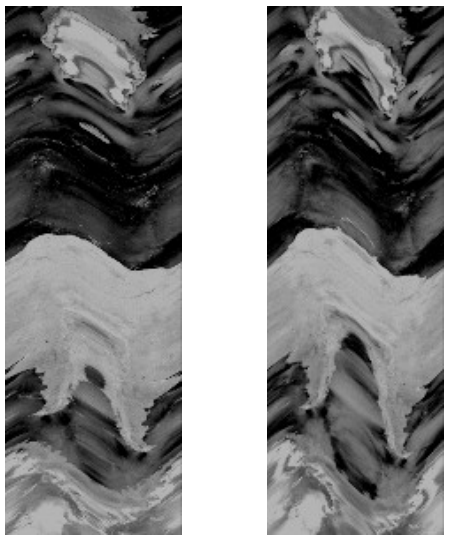
SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

Table of Contents

Image Snapshot for Inner & Outer Beam

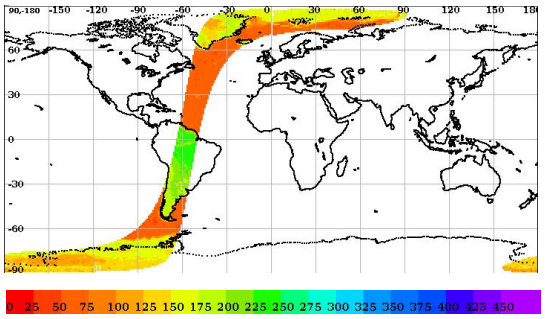
Inner (HH) **Outer (VV)**



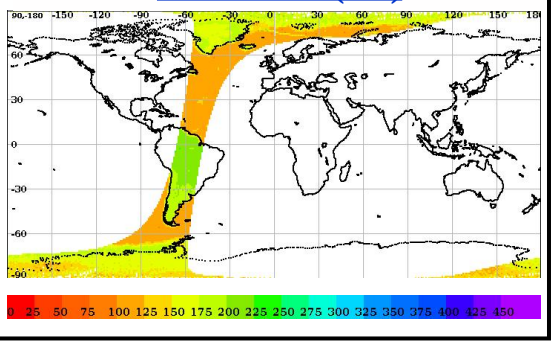
Satellite Id	ScatSat-1	**Start Orbit**	15055	**Total Scans**	1016
Sensor Name	Scatterometer	**End Orbit**	15056	**No of Inner FootPrints**	281
Processor Version	v1.1.3	**Rev. Number**	15055_15056	**No Of Outer FootPrints**	282
Half Orbit Direction	NS	**Data Production Date**	31-07-2019	**No. Of Inner Slices**	9
Equator Crossing Date	31-07-2019	**Equator Crossing Time**	12:17:16.000	**No Of Outer Slices**	15

Brightness Temprature(k) Footprint trace

Inner Beam (HH)

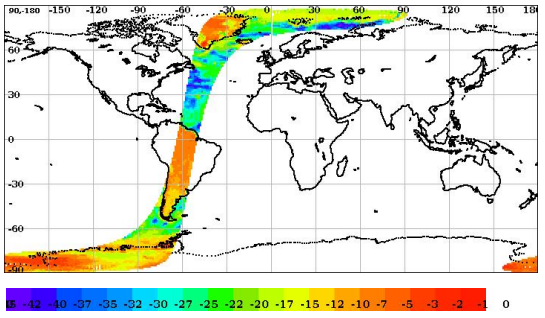


Outer Beam (VV)

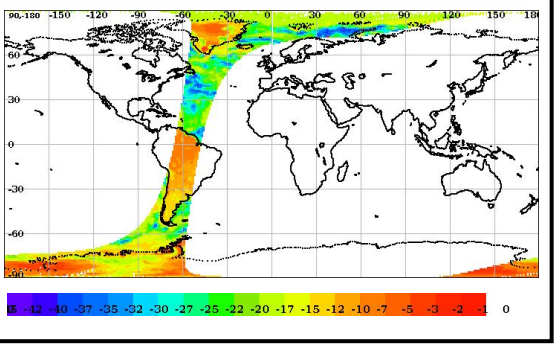


Sigma0(dB) Footprint trace

Inner Beam (HH)



Outer Beam (VV)



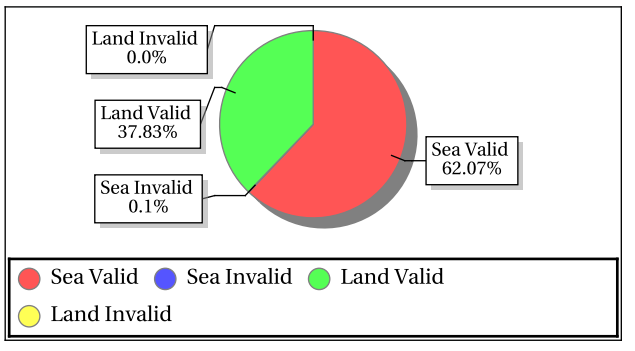
Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.10	0.10
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(%)	22.23	13.34
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 (%)	0.045697	0.101835

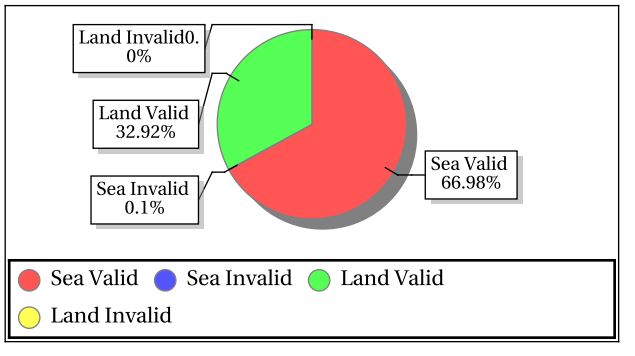
*DP Format Document

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	-5.85	-4.27	-5.06	0.50	117.81	140.71	130.77	7.51
GreenLand_2	77.50	-41.50	Inner	DSC	Fore	-5.57	-4.05	-4.83	0.44	101.30	145.07	125.47	13.27
GreenLand_3	71.55	-42.45	Inner	DSC	Aft	-11.23	-8.78	-9.63	0.62	105.91	153.06	133.30	13.42
GreenLand_3	71.55	-42.45	Inner	DSC	Fore	-10.75	-8.21	-9.43	0.69	115.15	169.74	142.29	16.72
Amazon_3	-6.00	-61.00	Inner	DSC	Aft	-8.84	-5.94	-7.44	0.68	198.29	259.82	231.22	16.40
Amazon_3	-6.00	-61.00	Inner	DSC	Fore	-8.90	-6.67	-7.83	0.57	194.75	253.51	229.83	13.06
GreenLand_1	74.69	-42.50	Inner	DSC	Aft	-10.04	-7.21	-8.70	0.65	103.04	145.90	128.84	9.99
GreenLand_1	74.69	-42.50	Inner	DSC	Fore	-10.55	-7.15	-8.97	1.01	114.70	152.80	131.43	10.54
Amazon_2	-3.00	-61.00	Inner	DSC	Aft	-12.86	-6.08	-8.36	1.34	154.32	257.51	202.91	26.56
Amazon_2	-3.00	-61.00	Inner	DSC	Fore	-10.47	-6.35	-8.23	0.93	167.10	256.37	208.93	20.04
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-5.72	-4.85	-5.33	0.35	140.04	174.68	157.53	12.55
GreenLand_2	77.50	-41.50	Outer	DSC	Fore	-5.35	-4.89	-5.19	0.19	154.55	173.77	164.51	7.79
GreenLand_3	71.55	-42.45	Outer	DSC	Aft	-11.96	-10.74	-11.57	0.35	145.98	172.02	161.58	9.43
GreenLand_3	71.55	-42.45	Outer	DSC	Fore	-12.02	-10.56	-11.49	0.37	141.90	183.90	165.40	12.21
Amazon_3	-6.00	-61.00	Outer	DSC	Aft	-10.36	-8.04	-9.19	0.50	184.12	244.41	217.77	16.79
Amazon_3	-6.00	-61.00	Outer	DSC	Fore	-10.35	-8.00	-9.03	0.53	188.10	260.63	218.09	17.25
GreenLand_1	74.69	-42.50	Outer	DSC	Aft	-10.12	-7.69	-8.99	0.70	145.18	190.06	166.24	13.06
GreenLand_1	74.69	-42.50	Outer	DSC	Fore	-9.78	-8.06	-8.97	0.57	158.96	207.39	180.88	14.27
Amazon_2	-3.00	-61.00	Outer	DSC	Aft	-11.68	-7.45	-9.71	0.98	172.86	239.86	206.78	16.37
Amazon_2	-3.00	-61.00	Outer	DSC	Fore	-11.46	-8.17	-9.50	0.79	176.60	244.35	207.98	17.01

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	280.48	0.49	5.489	0.12	290.34	0.39	3.730	0.12	0.17	0.12	0.000	0.12	0.15	0.12	0.000
Kpa	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
Kpb	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
Kpc	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
SNR	-34.61	23.34	3.61	0.051	-34.76	24.35	3.83	0.095	1.62	29.81	18.58	8.817	3.13	29.58	19.42	19.423

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	0.09	215.91	0.41	5.011	0.09	223.42	0.35	3.268	0.09	0.26	0.09	0.000	0.09	0.24	0.09	0.000
Kpa	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
Kpb	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
Kpc	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
SNR	-34.65	18.15	1.49	0.000	-34.79	17.46	1.78	0.000	-4.08	21.93	13.18	0.000	-3.65	23.22	13.71	0.219

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)

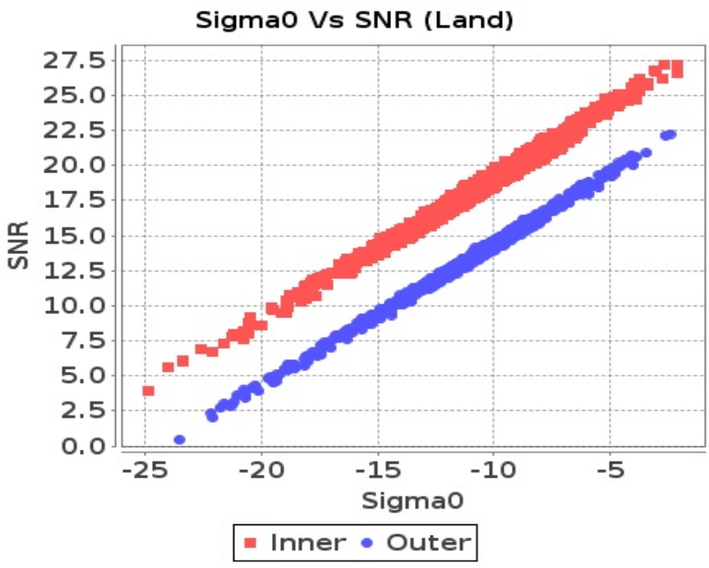
	Inner Beam (HH)				Outer Beam (VV)			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Incidence Angle (deg)	48.67	49.33	49.00	0.000	57.45	58.14	57.87	0.000
Azimuth Diff. (deg)	0.0000	52.74	1.27	2.741	0.0000	299.78	1.27	3.913
Range(Km)	1029.96	1079.07	1049.49	0.000	1206.26	1267.44	1230.71	6.051
X Factor(dbm)	-91.83	-90.01	-90.58	0.000	-93.29	-92.04	-92.19	0.000
Across Distance (Km)	15.91	16.42	16.08	0.000	10.63	37.29	21.19	4.000
Along Distance (Km)	18.91	8954.35	37.38	3.000	18.56	8824.51	37.05	3.000

Parameter Specifications		
Parameter	Min	Max
Inci.(Inner)	47.10	49.90
Inci.(Outer)	57.30	58.90
Azimuth Diff.	0.60	2.00
Range(Inner)	1025.00	1095.70
Range(Outer)	1210.00	1280.00
X-Factor	-100.00	-80.00
Ac.Dist(Inner)	15.00	20.00
Ac.Dist(Outer)	15.00	22.00
Al.Dist(Inner)	15.00	30.00
Al.Dist(Outer)	10.00	30.00

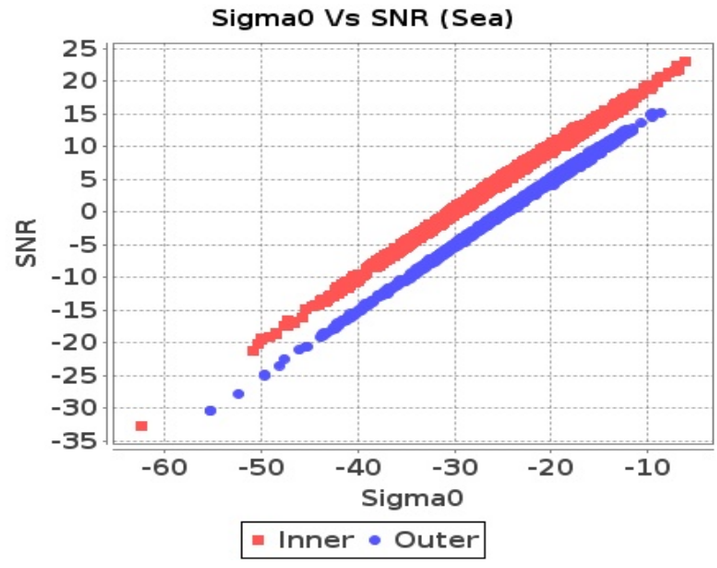
Normal
Deviations
Alarming
High Errors

Sigma0 Behaviour (Sigma0 Vs SNR)

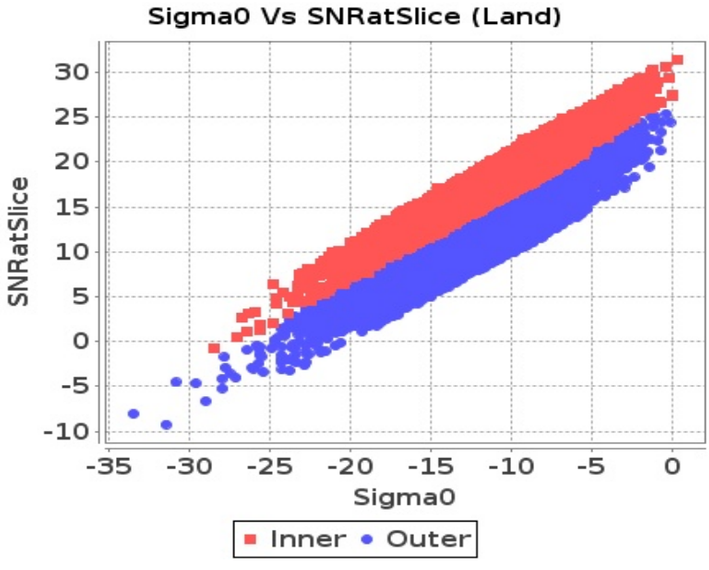
Footprint-Land



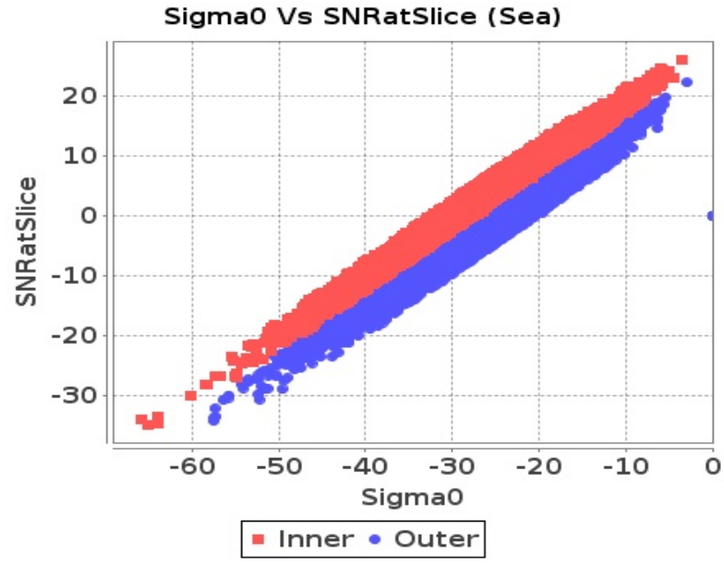
Footprint-Sea



Slice-Land

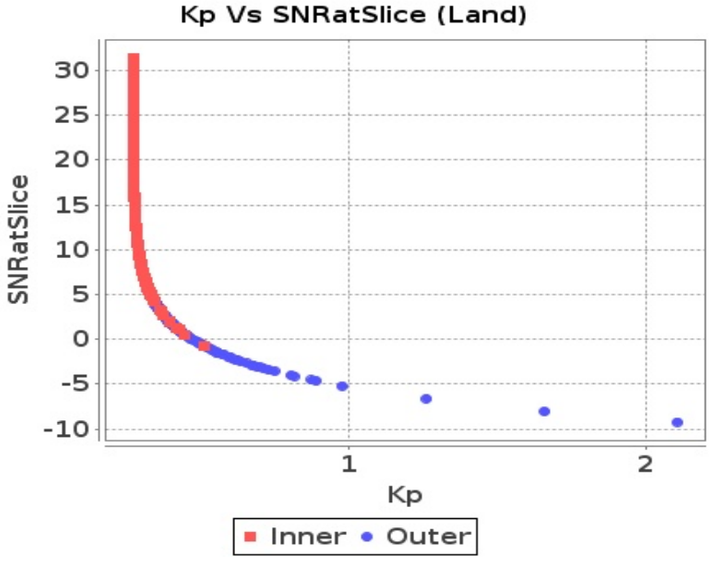


Slice-Sea

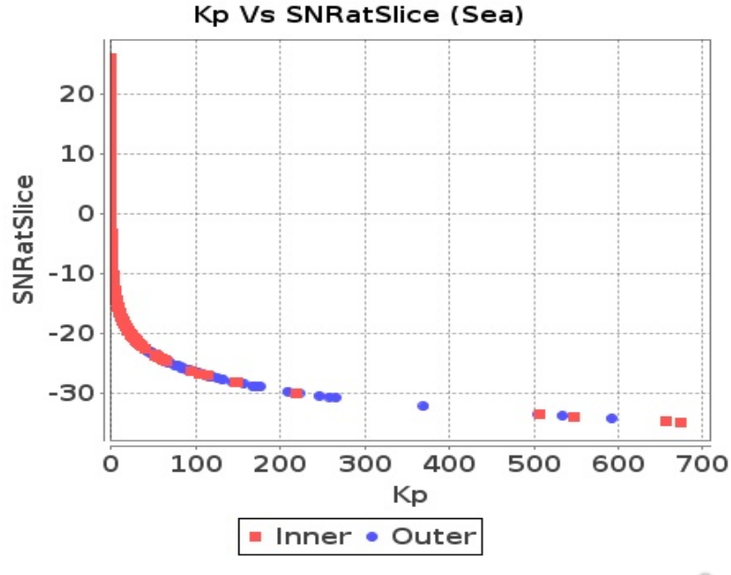


Sigma0 Behaviour (Kp Vs SNR)

Slice

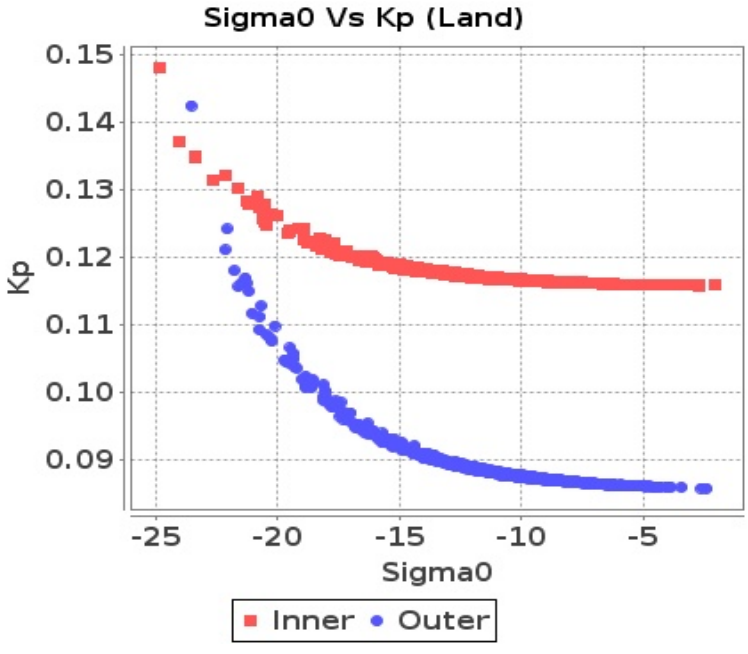


Slice

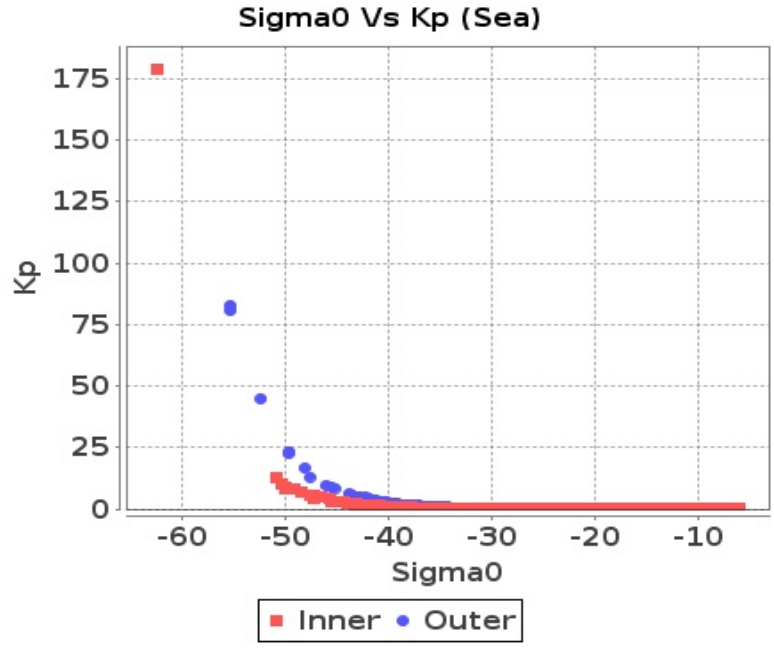


Sigma0 Behaviour(Sigma0 Vs Kp)

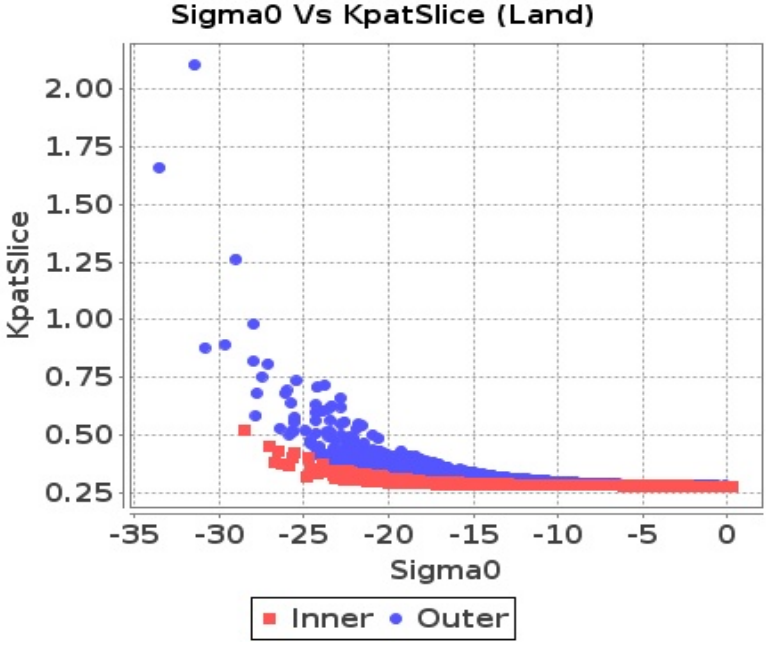
Footprint-Land



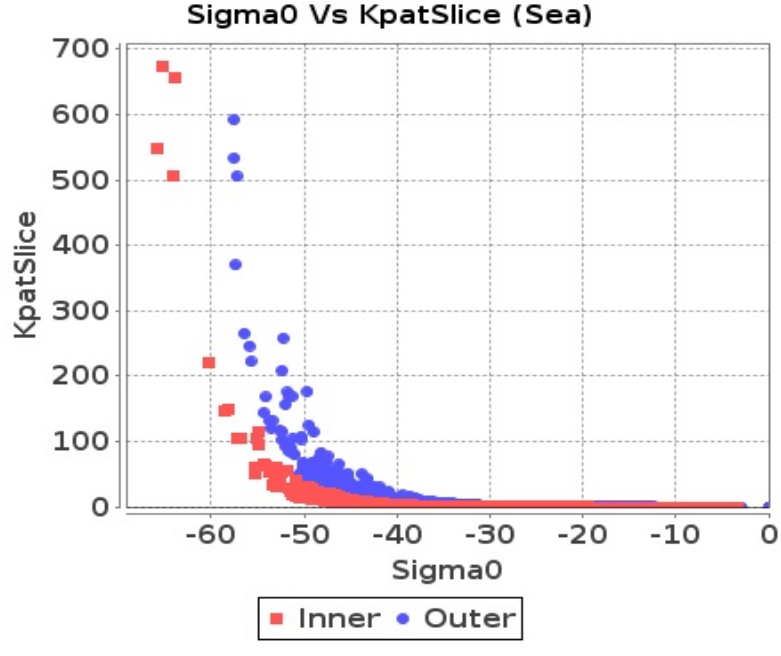
Footprint-Sea



Slice-Land



Slice-Sea

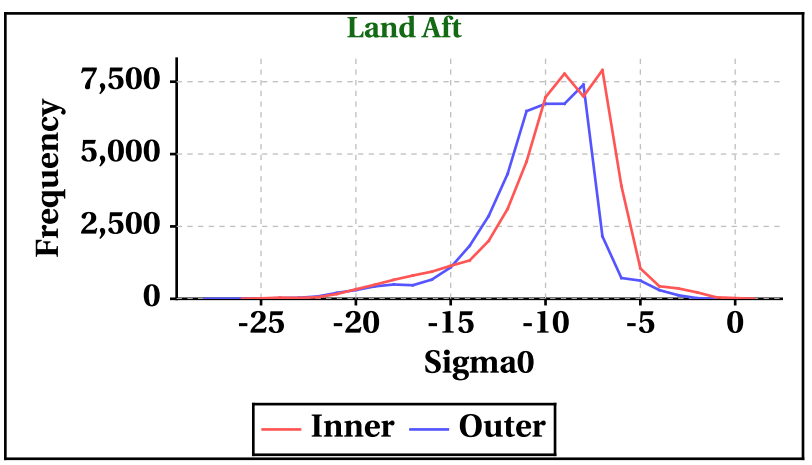


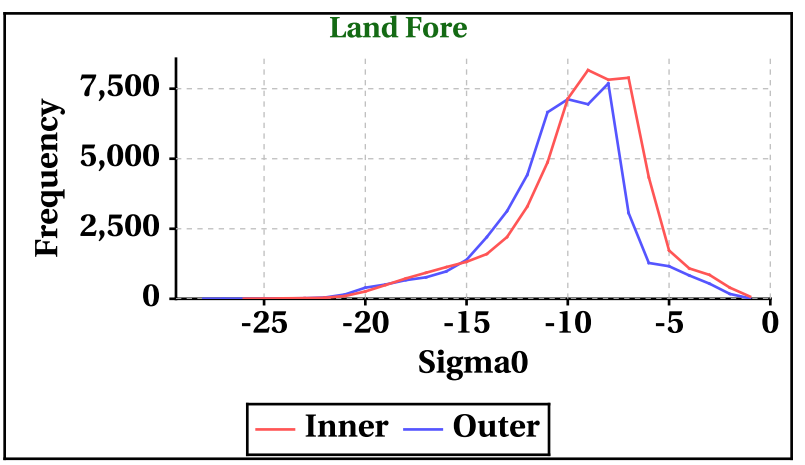
Dynamic Range (Data Histograms)

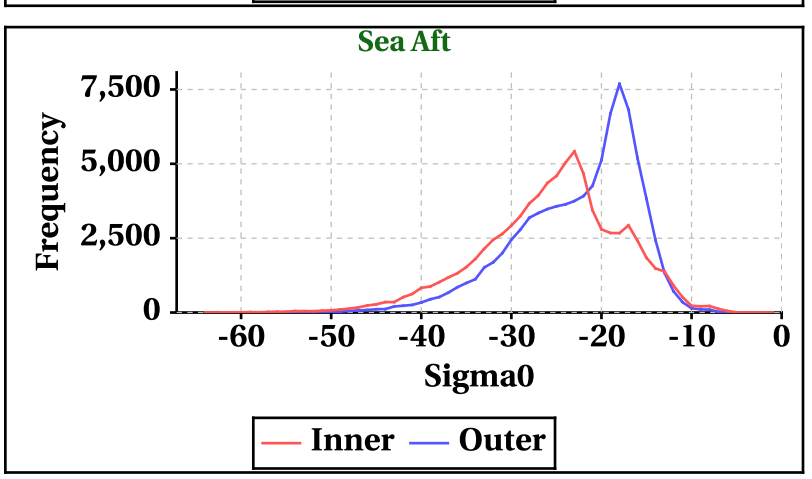
Sigma0(db)

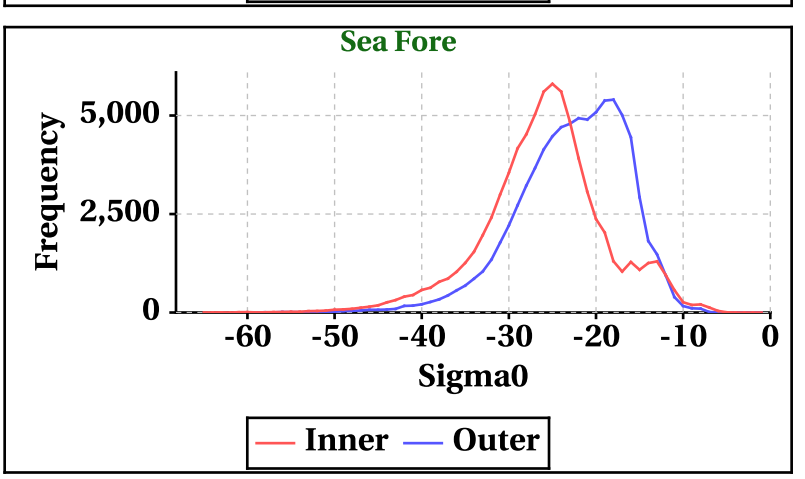
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-26	-26	-64	-65
Max	1	0	0	0

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-28	-28	-59	-59
Max	0	0	0	0





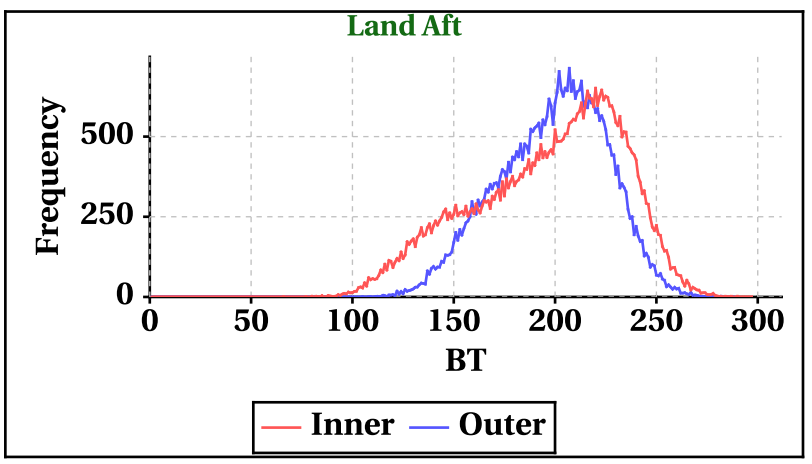


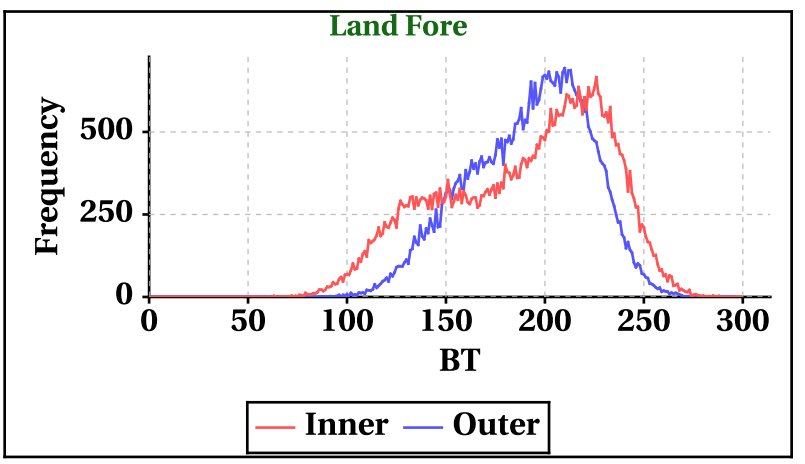


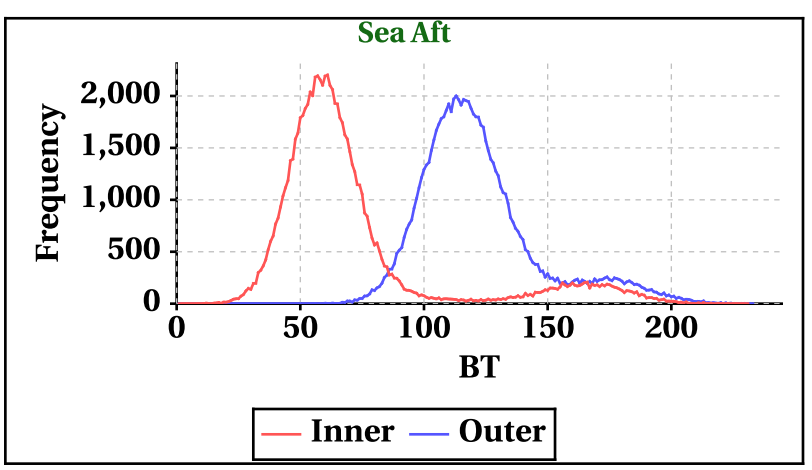
Brightness Temperature(K)

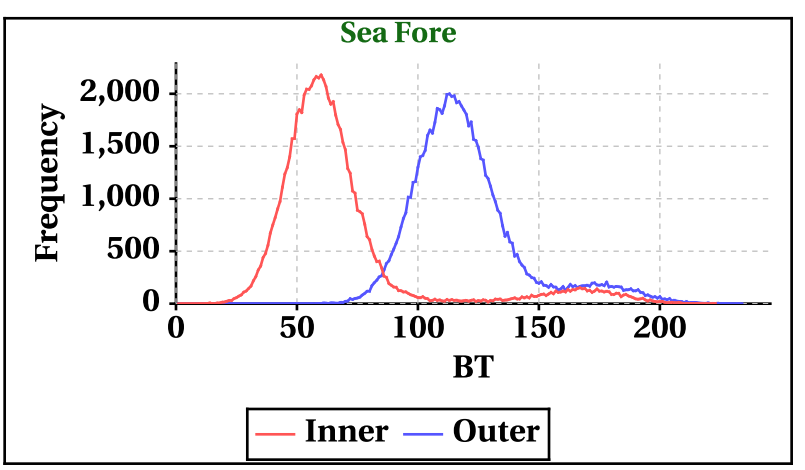
Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	297	299	231	223

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	288	296	233	234







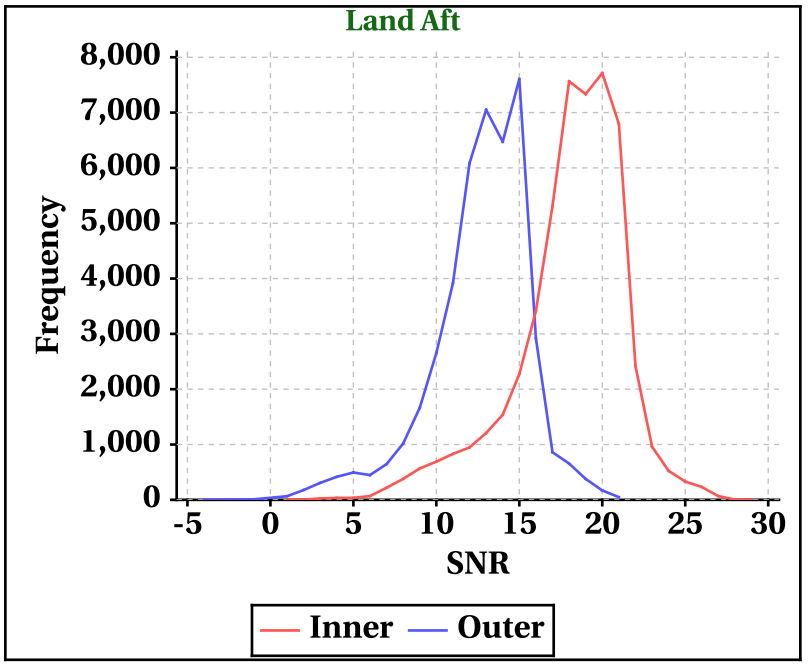


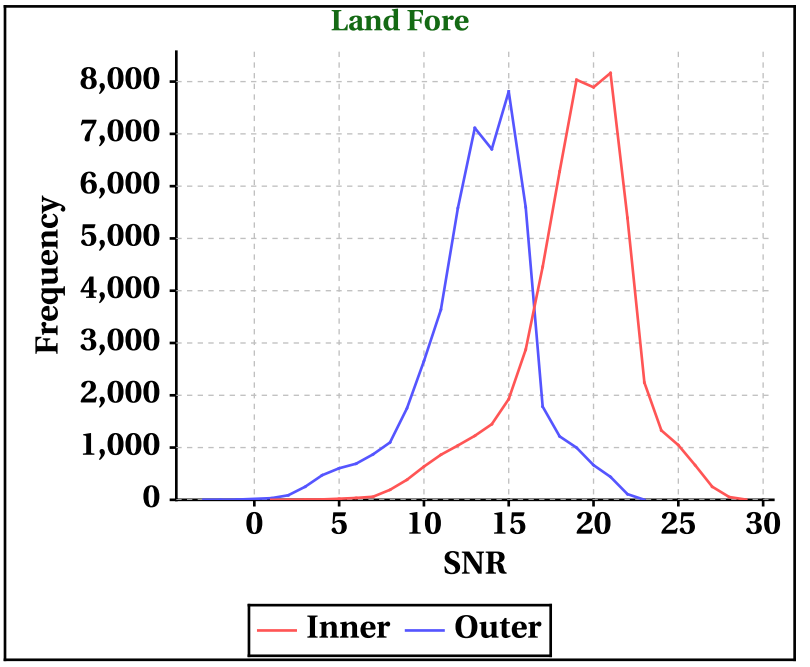
Dynamic Range (Data Histograms)

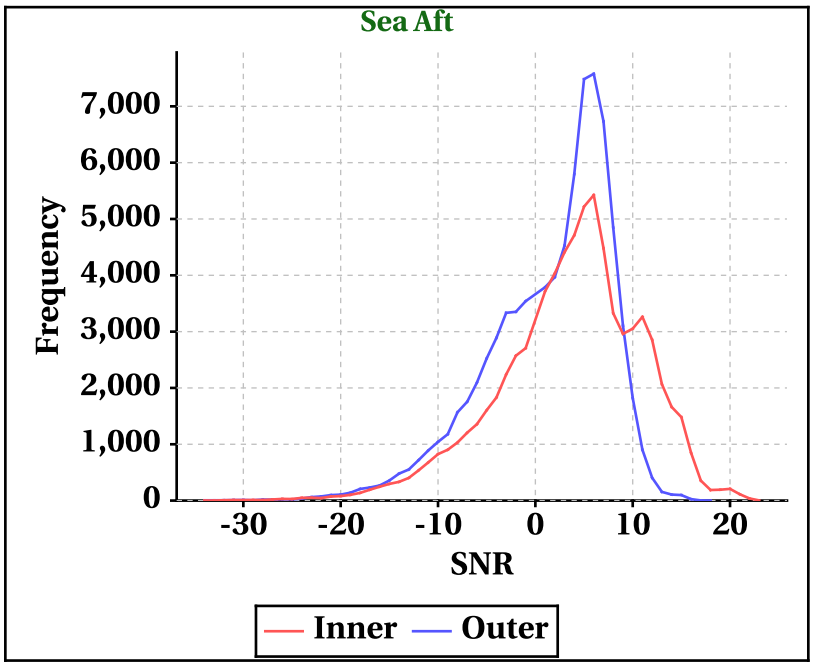
SNR(dBm)

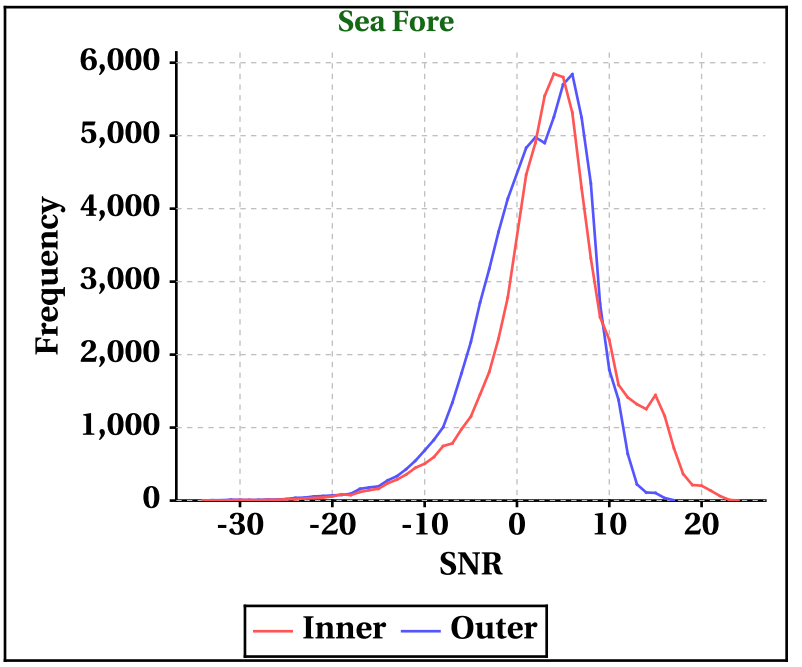
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	29	29	23	24

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-4	-3	-34	-34
Max	21	23	18	17



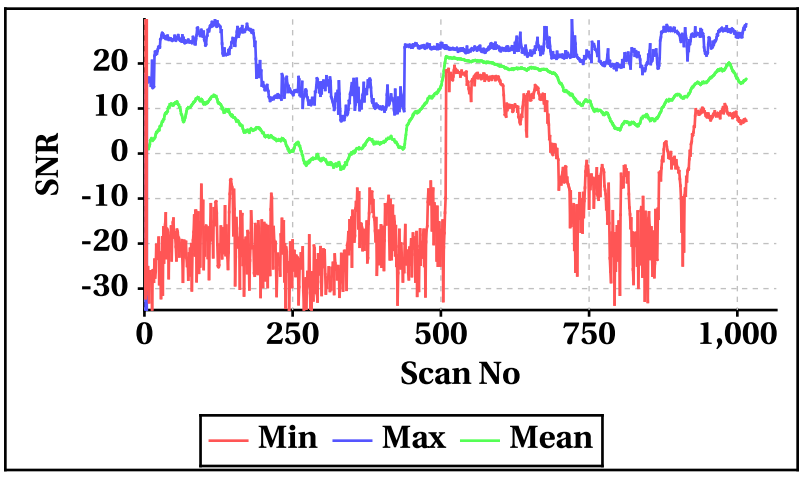




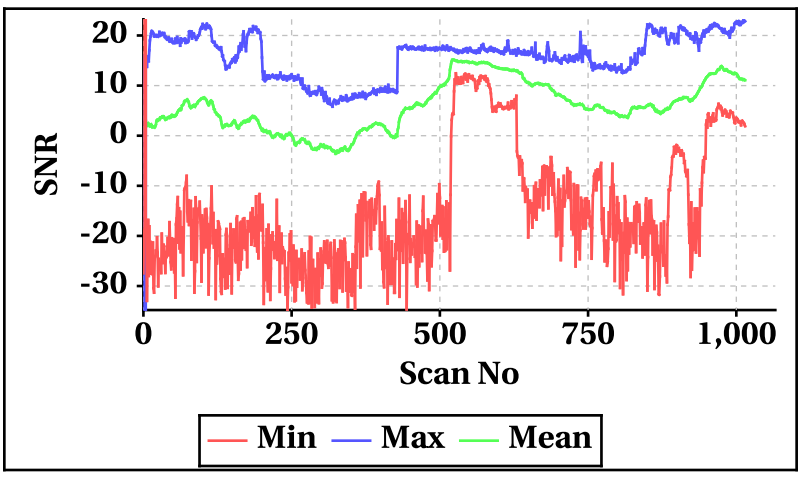


Orbit-wise behaviour of SNR

Inner Beam (HH)

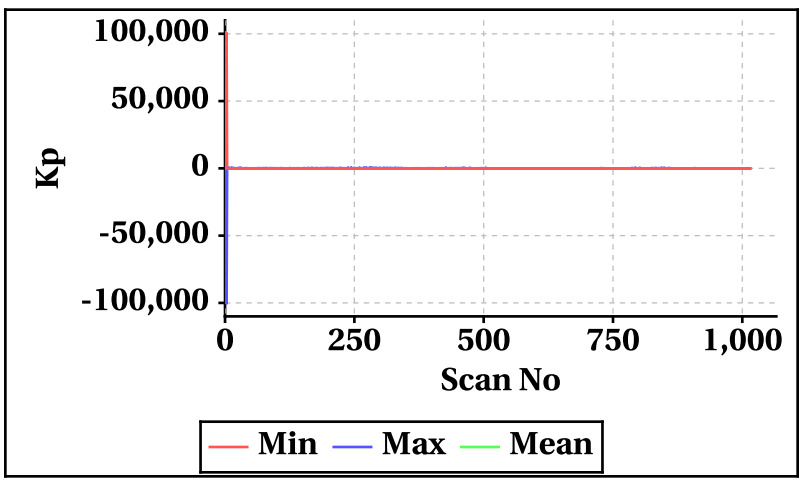


Outer Beam(VV)

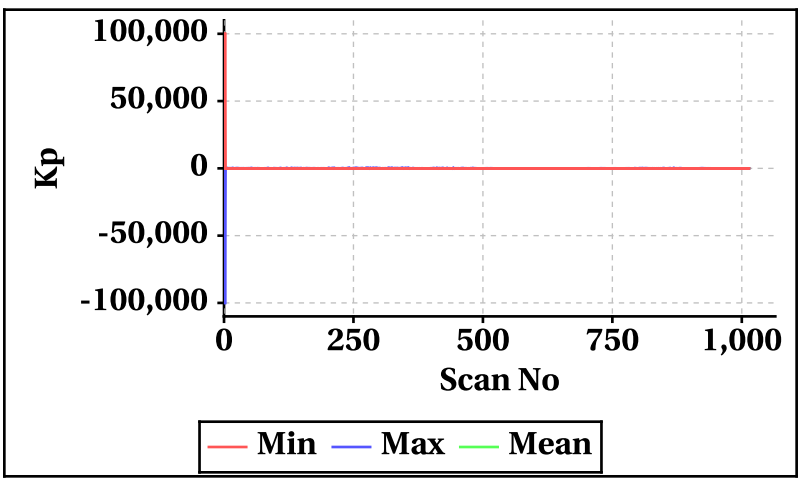


Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

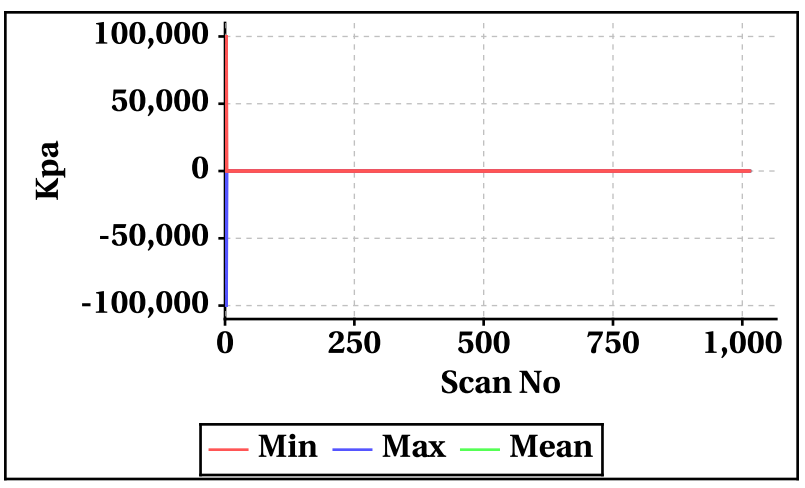
Inner Beam(HH)



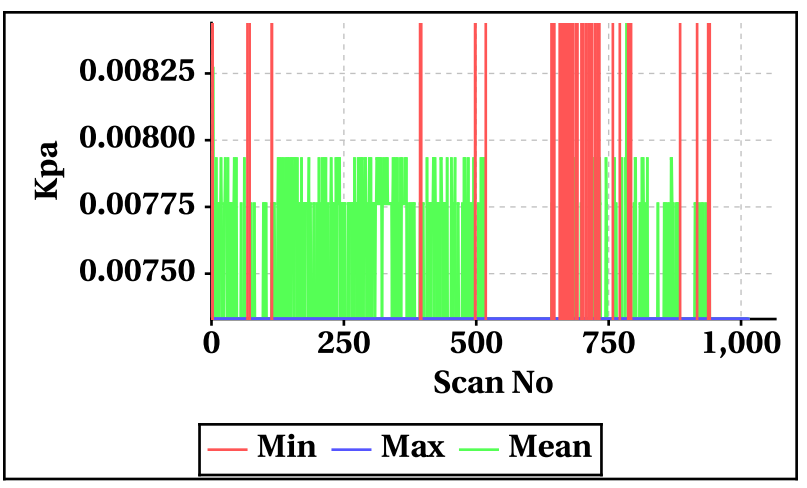
Outer Beam(VV)



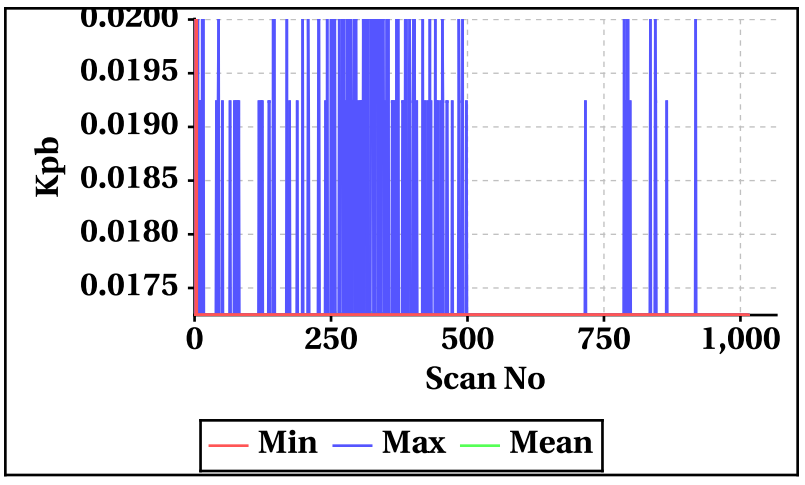
Inner Beam(HH)



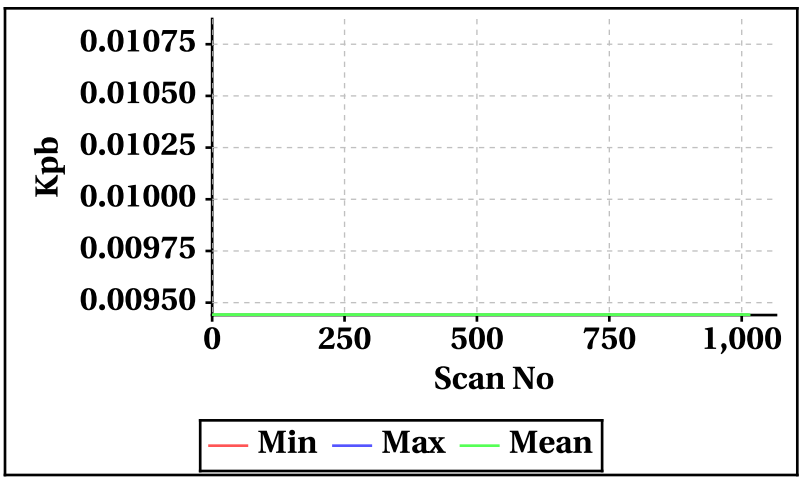
Outer Beam(VV)



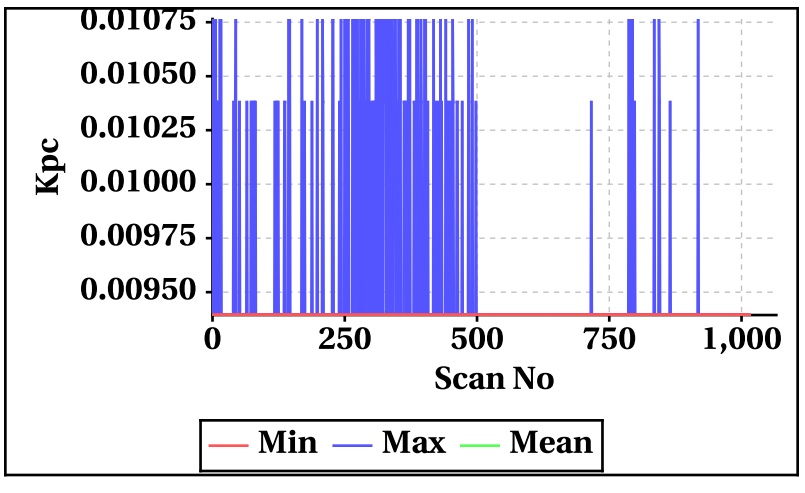
Inner Beam(HH)



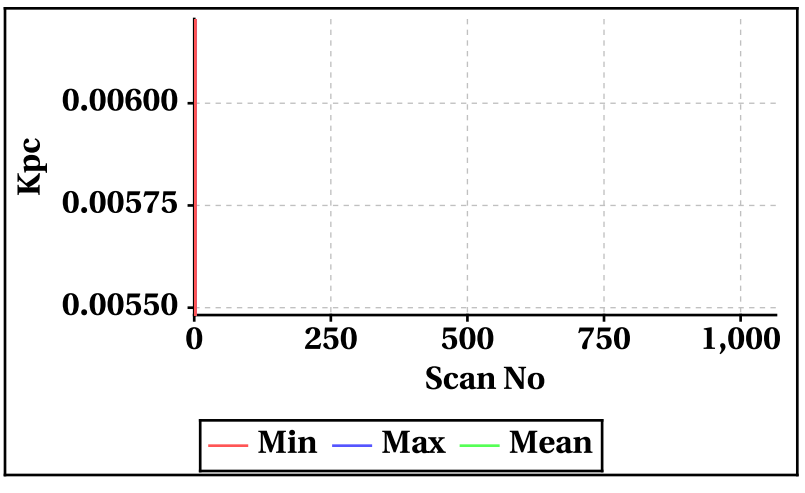
Outer Beam(VV)



Inner Beam(HH)

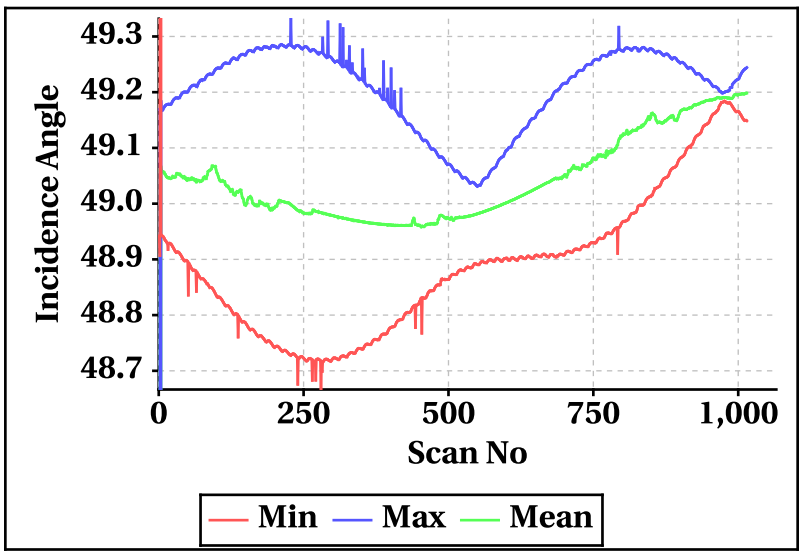


Outer Beam(VV)

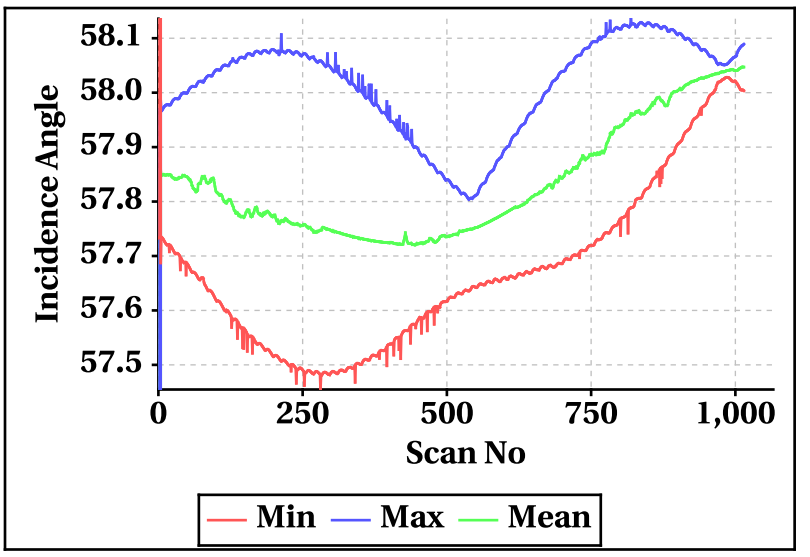


Orbit-wise behaviour of Incidence,Azimuth,Range,X-Factor

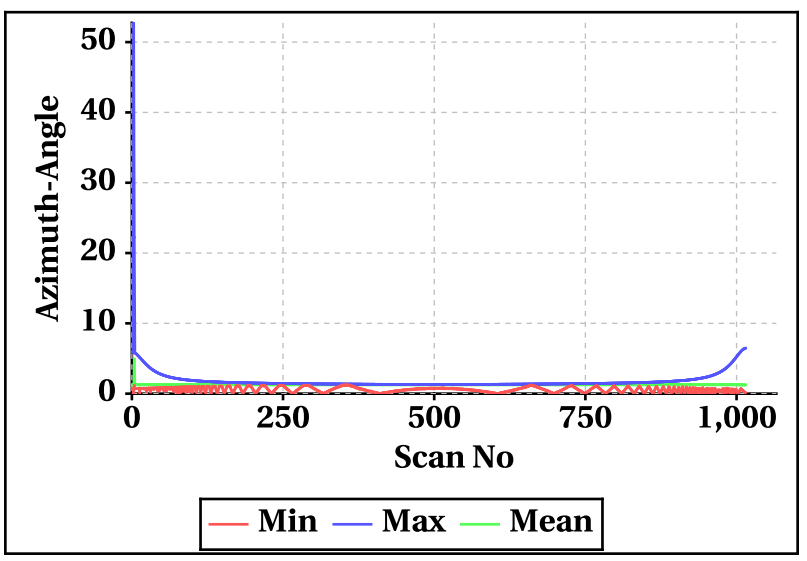
Inner Beam (HH)



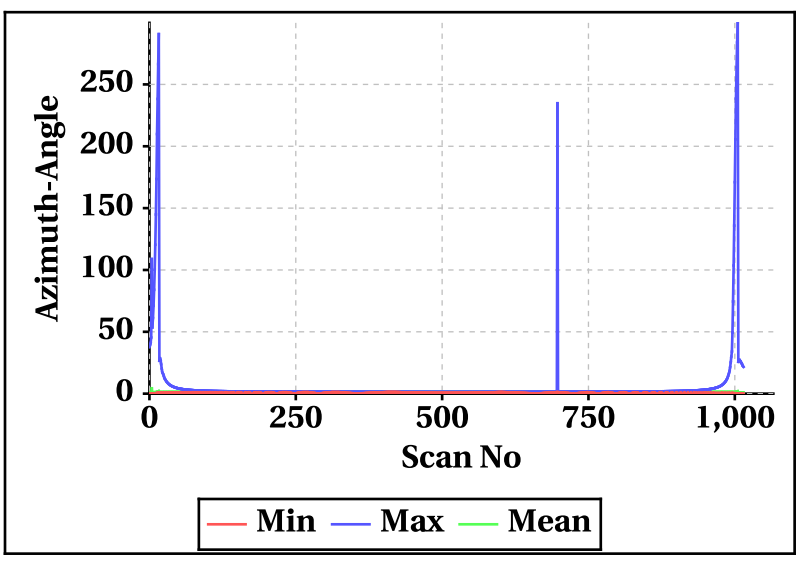
Outer Beam(VV)



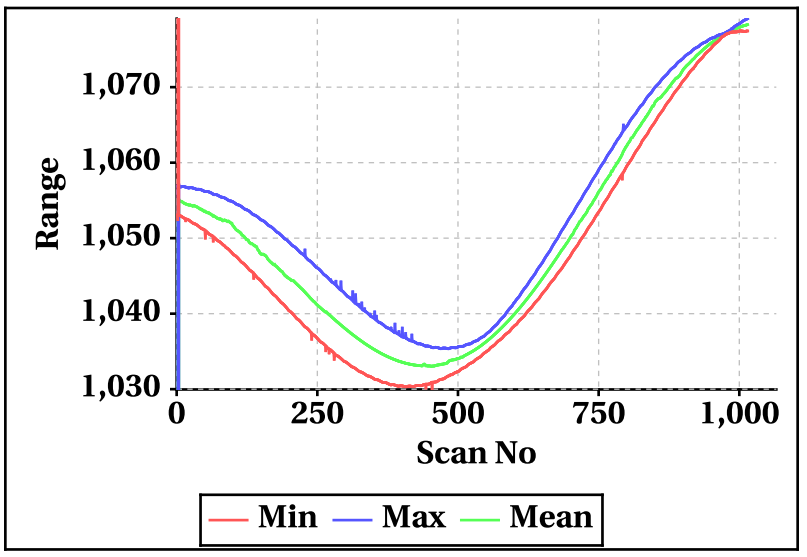
Inner Beam (HH)



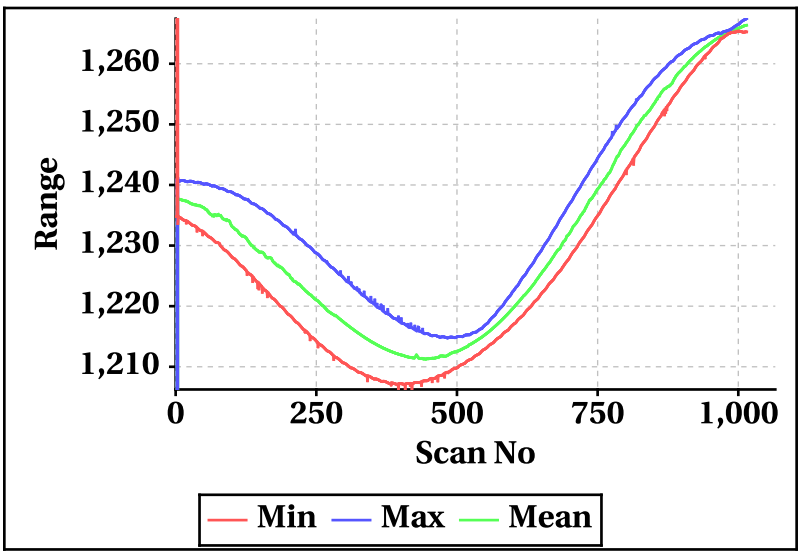
Outer Beam(VV)



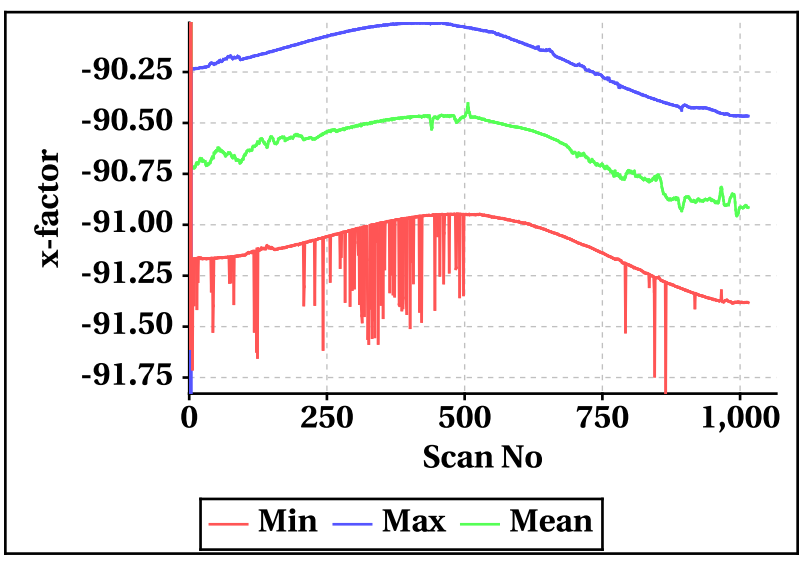
Inner Beam (HH)



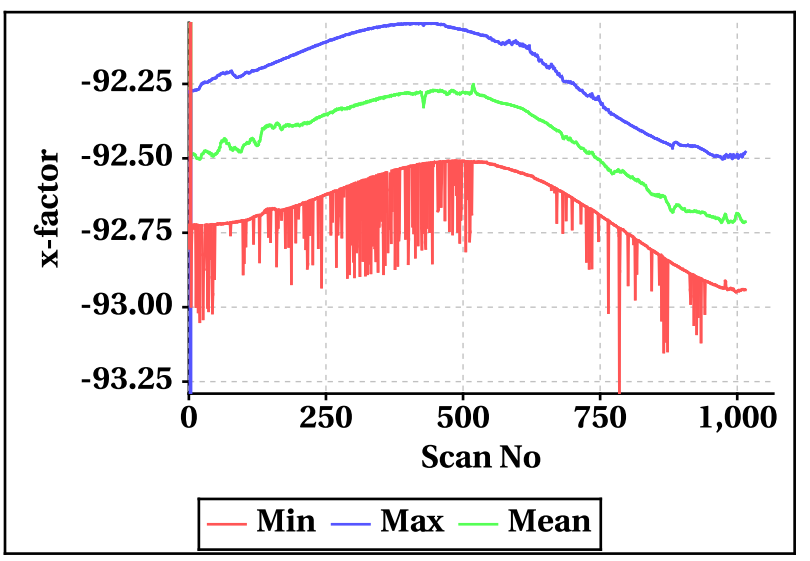
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



Doppler Frequency Variation

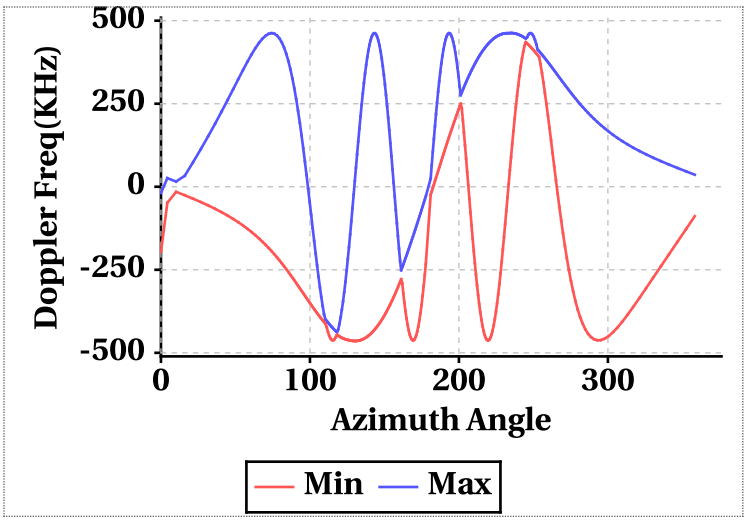
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-464.36	-520.20
Max	462.68	518.72

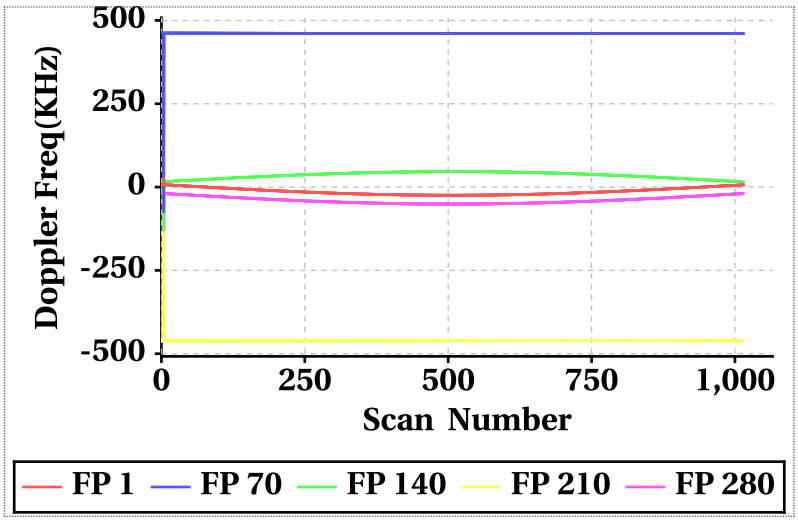
Doppler Frequency(KHz) variation

	Inner Beam (HH)			Outer Beam (VV)		
Doppler_FP	Min	Max	Mean	Min	Max	Mean
Doppler_1	-24.54	24.42	-12.93	-32.96	4.70	-20.01
Doppler_70	-72.80	462.14	460.47	-103.88	517.80	515.80
Doppler_140	-128.12	46.46	34.99	-121.46	46.40	33.54
Doppler_210	-461.80	2.20	-460.52	-517.80	2.56	-516.45
Doppler_280	-196.44	2.10	-39.51	-199.18	2.48	-38.26

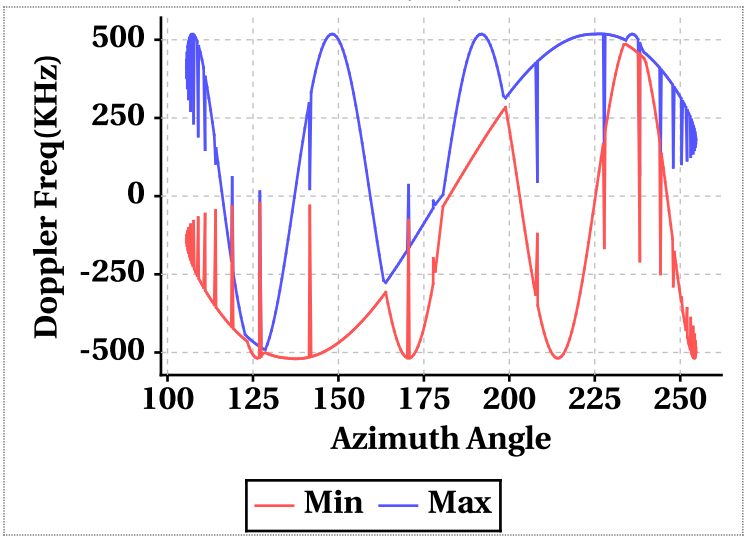
Footprint wise Doopler frequency variation Inner Beam (HH)



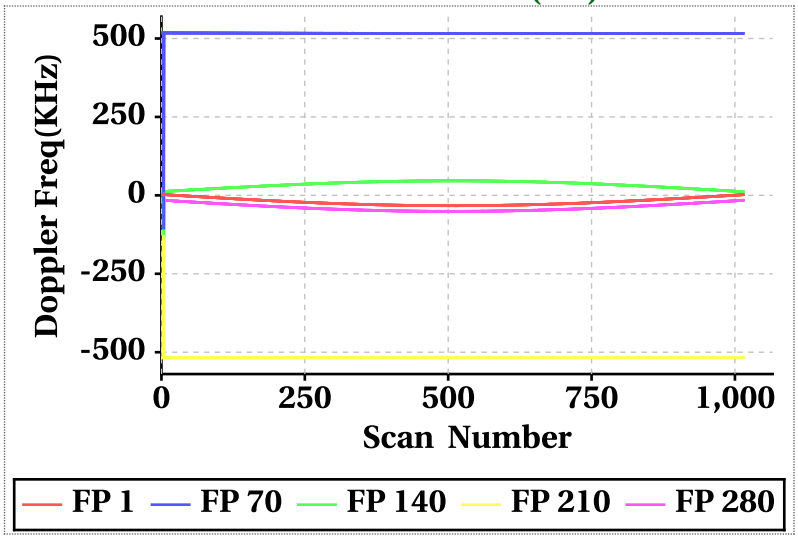
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doopler frequency variation Outer Beam (VV)

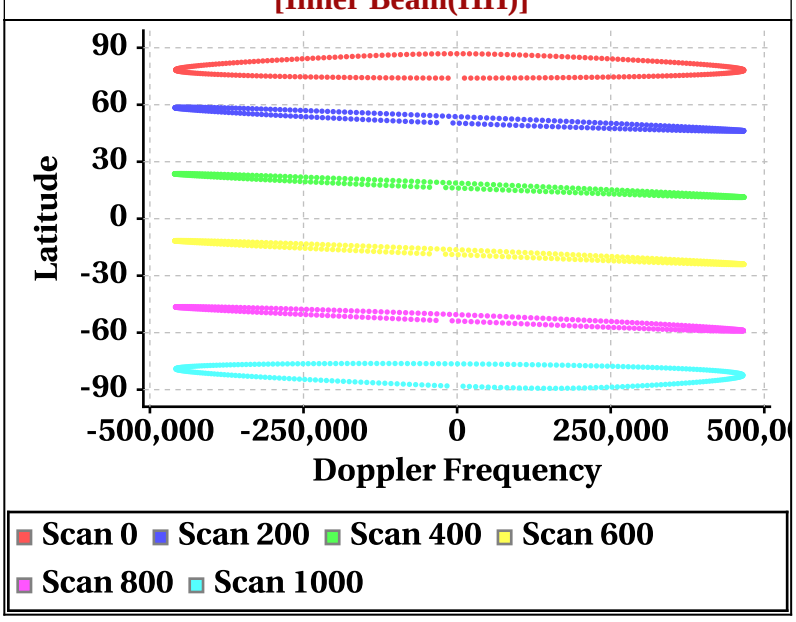


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

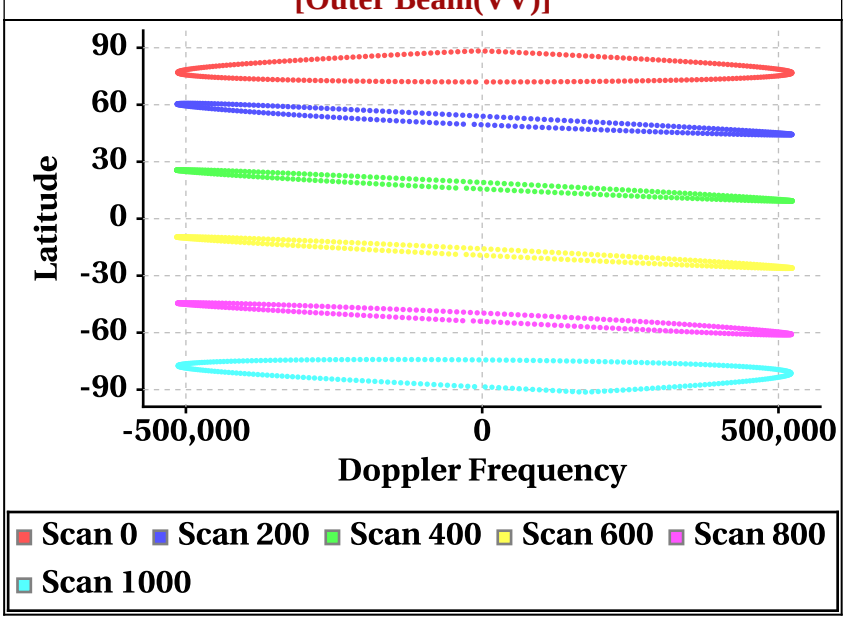


Latitude Vs Doppler Frequency

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



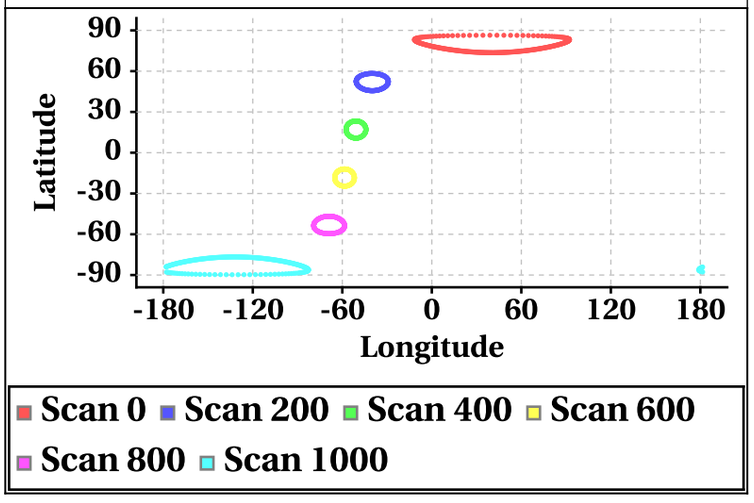
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



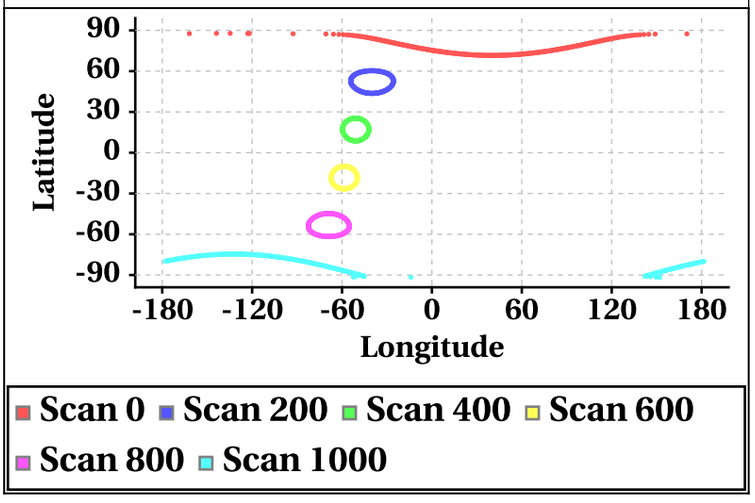
Parameter as a function of Latitude

Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]

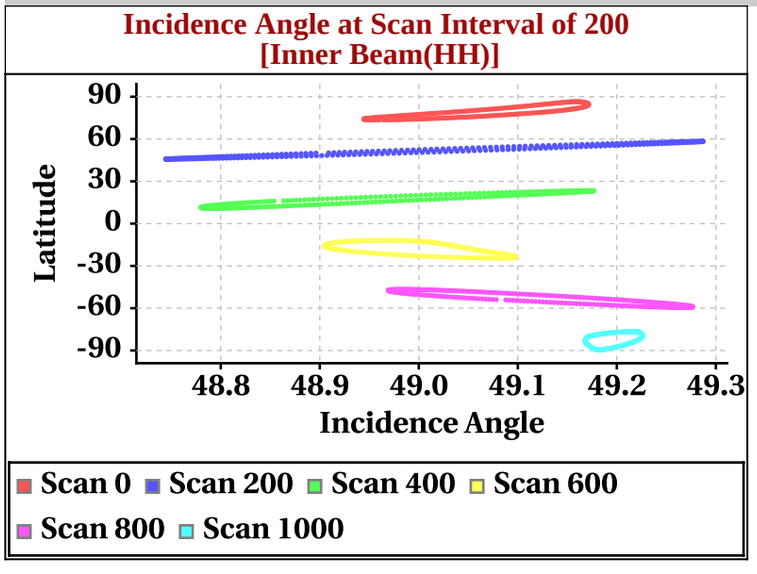


Scan Trace [Outer Beam (VV)]

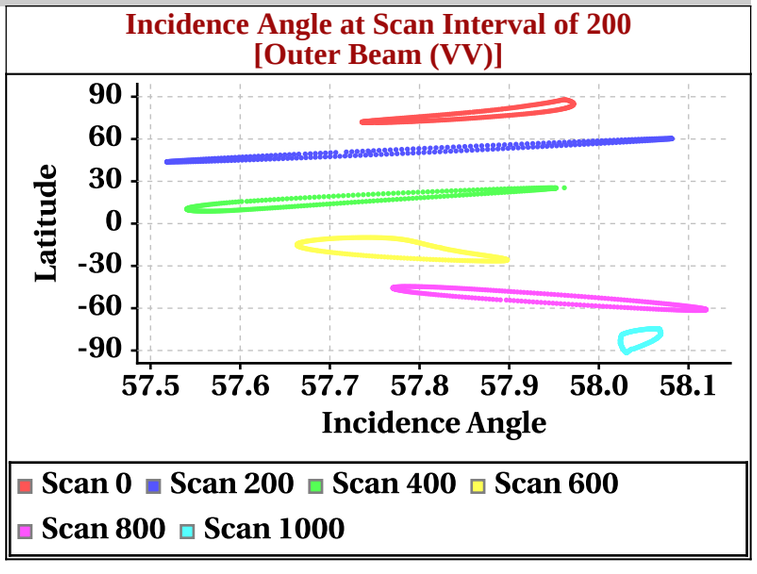


Latitude Vs Incidence Angle

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

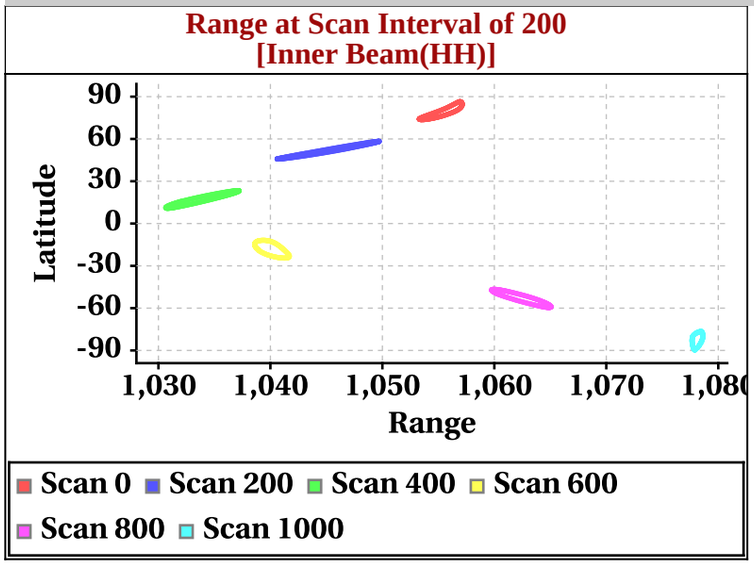


Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

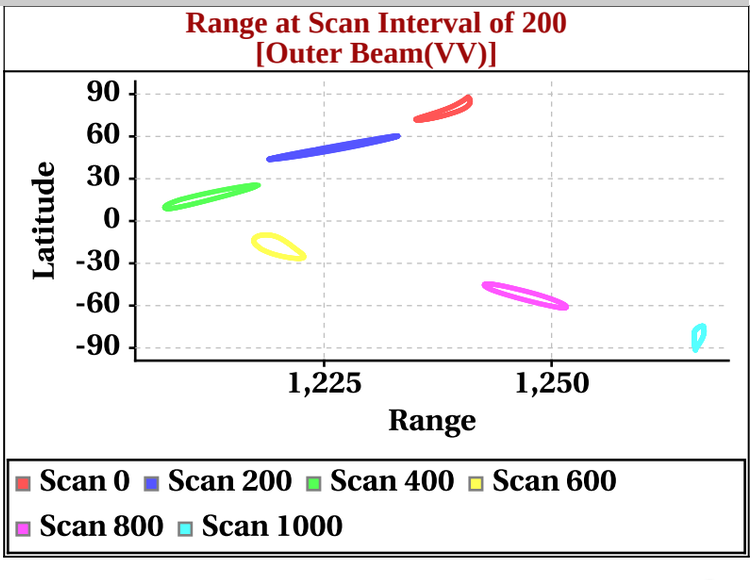


Latitude Vs Range

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

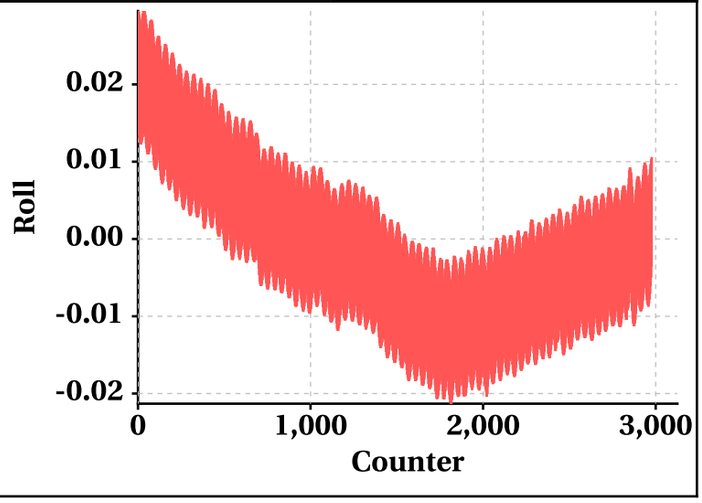


Range at Scan Interval of 200 [Outer Beam(VV)]

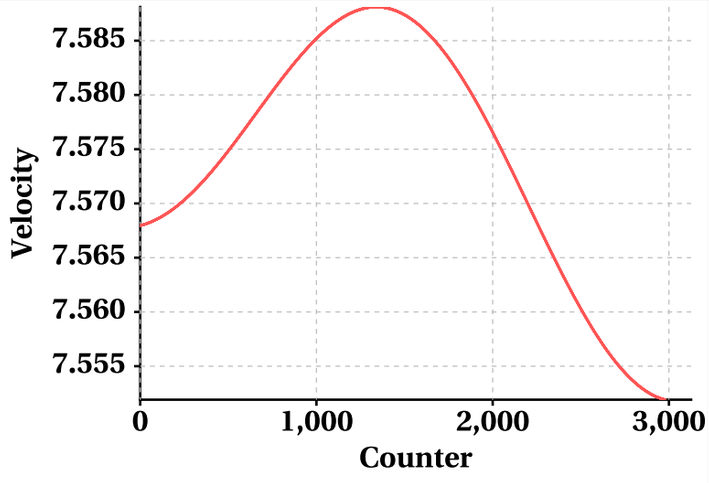


Variation in Orbit and Attitude Parameters

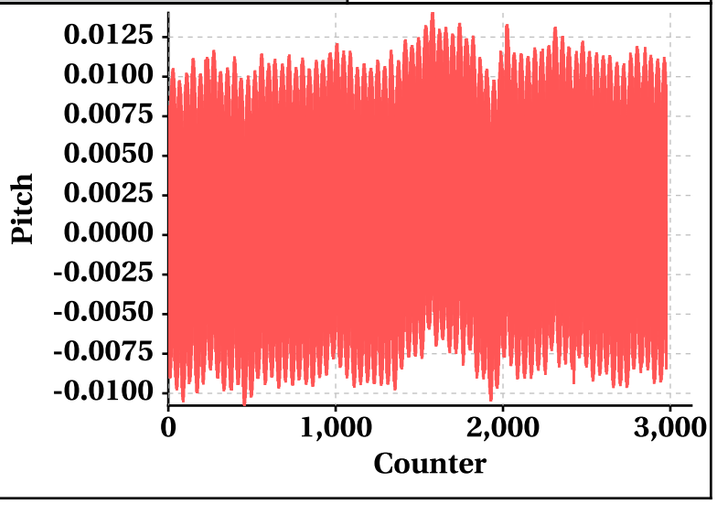
Roll	
Min Roll(deg)	-0.021313
Max Roll(deg)	0.0295



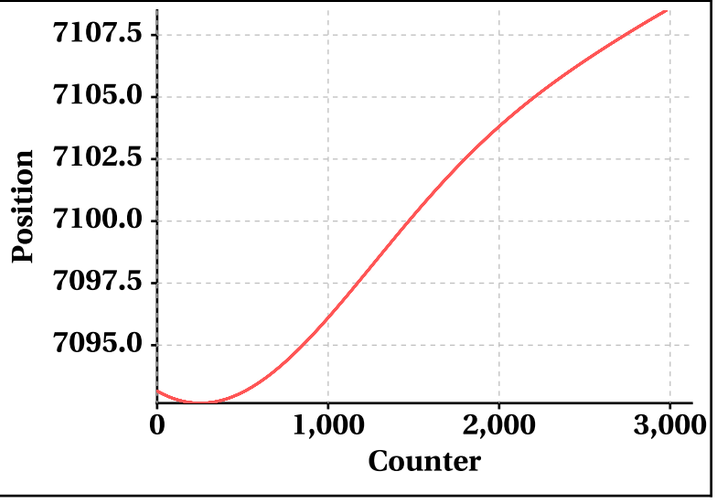
Velocity	
Min Velocity(km/s)	7.551913
Max Velocity(km/s)	7.588106



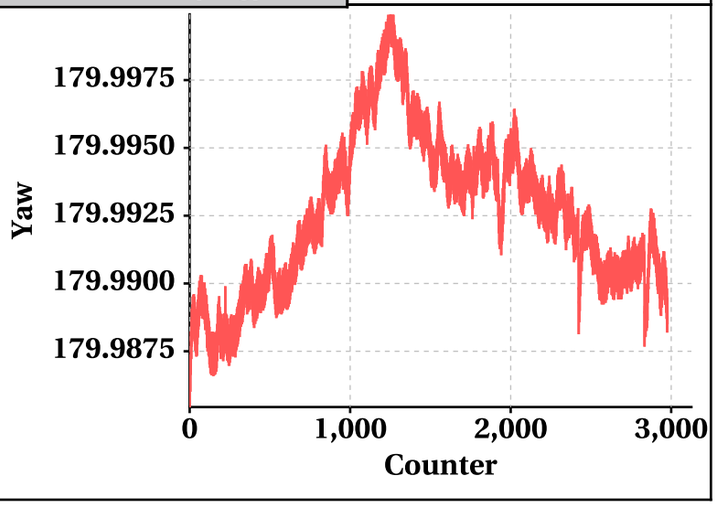
Pitch	
Min Pitch(deg)	-0.010776
Max Pitch(deg)	0.014029



Position	
Min Position(km)	7092.664062
Max Position(km)	7108.490234



Yaw	
Min Yaw(deg)	179.985443
Max Yaw(deg)	179.999924



TimeDifference	
Min TimeDifference	1.0
Max TimeDifference	1.0