

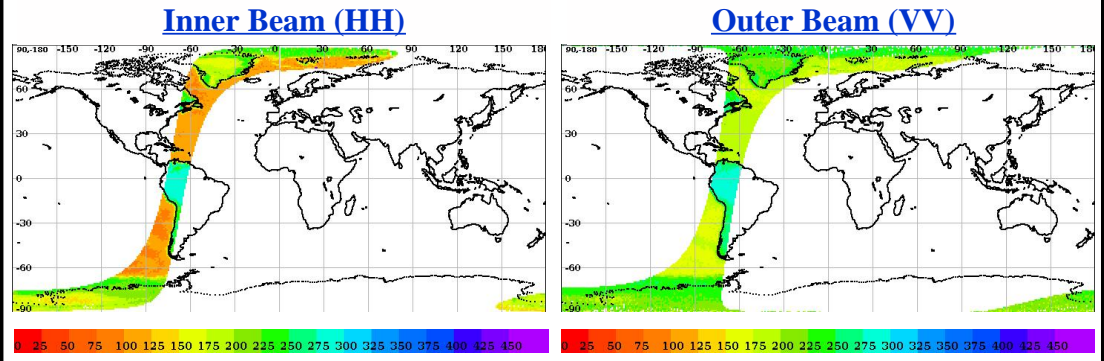
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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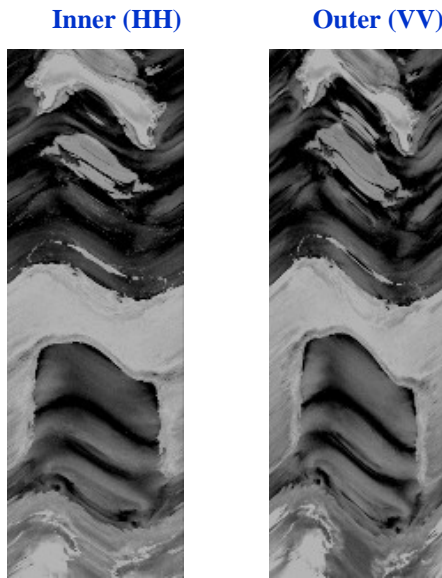
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|                              |               |                              |              |                               |      |
|------------------------------|---------------|------------------------------|--------------|-------------------------------|------|
| <b>Satellite Id</b>          | ScatSat-1     | <b>Start Orbit</b>           | 9966         | <b>Total Scans</b>            | 1017 |
| <b>Sensor Name</b>           | Scatterometer | <b>End Orbit</b>             | 9967         | <b>No of Inner FootPrints</b> | 281  |
| <b>Processor Version</b>     | v1.1.3        | <b>Rev. Number</b>           | 09966_09967  | <b>No Of Outer FootPrints</b> | 282  |
| <b>Half Orbit Direction</b>  | NS            | <b>Data Production Date</b>  | 14-08-2018   | <b>No. Of Inner Slices</b>    | 9    |
| <b>Equator Crossing Date</b> | 14-08-2018    | <b>Equator Crossing Time</b> | 13:17:32.000 | <b>No Of Outer Slices</b>     | 15   |

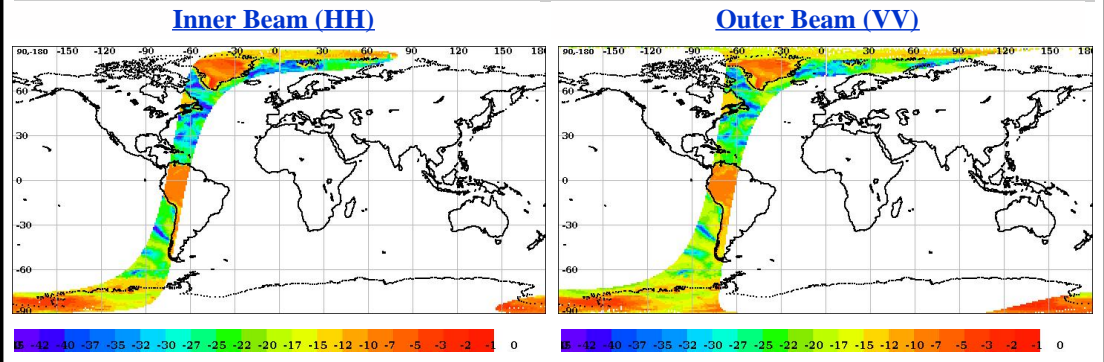
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



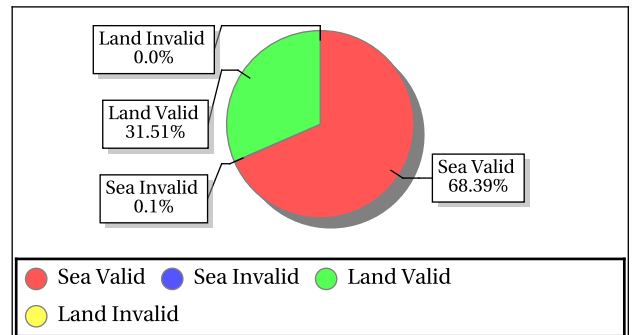
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

| Sigma-0 Flags                            | Inner Beam | Outer Beam |
|--|------------|------------|
| 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 (-96dB) (%)         | 0.0        | 0.0        |
| Sigma0 > upper bound (0 dB) (%)          | 0.00       | 0.00       |
| SNR < -65 dB (%)                         | 0.044602   | 0.089026   |

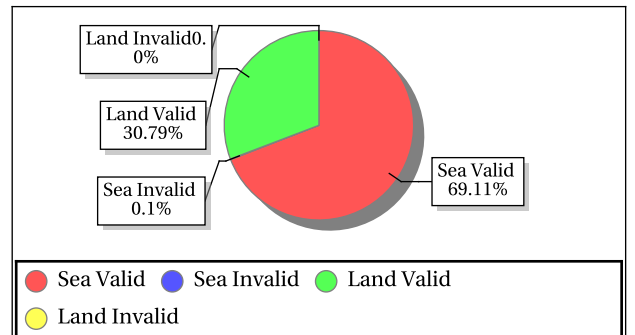
\*DP Format Document

## 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     | -6.81      | -5.41      | -5.94       | 0.50       | 139.09 | 185.73 | 163.05  | 15.76  |
| GreenLand_2 | 77.50      | -41.50     | Inner | DSC  | Fore    | -6.33      | -4.98      | -5.85       | 0.49       | 137.82 | 173.06 | 154.11  | 13.72  |
| GreenLand_3 | 71.55      | -42.45     | Inner | DSC  | Aft     | -12.48     | -10.42     | -11.55      | 0.59       | 183.25 | 245.54 | 204.20  | 16.30  |
| GreenLand_3 | 71.55      | -42.45     | Inner | DSC  | Fore    | -12.48     | -10.34     | -11.61      | 0.50       | 187.37 | 234.01 | 206.25  | 11.15  |
| GreenLand_1 | 74.69      | -42.50     | Inner | DSC  | Aft     | -10.27     | -6.97      | -9.44       | 1.01       | 153.28 | 197.91 | 176.26  | 12.56  |
| GreenLand_1 | 74.69      | -42.50     | Inner | DSC  | Fore    | -9.95      | -8.43      | -9.36       | 0.47       | 139.70 | 220.41 | 170.45  | 23.07  |
| Amazon_1    | 0.00       | -67.00     | Inner | DSC  | Aft     | -8.89      | -6.76      | -7.84       | 0.56       | 253.53 | 328.10 | 291.90  | 15.92  |
| Amazon_1    | 0.00       | -67.00     | Inner | DSC  | Fore    | -8.89      | -5.98      | -7.72       | 0.65       | 252.62 | 320.02 | 293.54  | 15.70  |
| GreenLand_2 | 77.50      | -41.50     | Outer | DSC  | Aft     | -5.77      | -5.42      | -5.54       | 0.13       | 204.50 | 241.03 | 224.41  | 13.94  |
| GreenLand_2 | 77.50      | -41.50     | Outer | DSC  | Fore    | -6.08      | -5.22      | -5.78       | 0.40       | 207.76 | 236.34 | 219.96  | 12.04  |
| GreenLand_3 | 71.55      | -42.45     | Outer | DSC  | Aft     | -13.47     | -11.19     | -12.44      | 0.69       | 209.91 | 280.91 | 234.57  | 17.97  |
| GreenLand_3 | 71.55      | -42.45     | Outer | DSC  | Fore    | -13.14     | -11.32     | -12.33      | 0.52       | 207.63 | 267.09 | 232.64  | 18.61  |
| GreenLand_1 | 74.69      | -42.50     | Outer | DSC  | Aft     | -9.77      | -8.20      | -9.19       | 0.64       | 195.31 | 237.06 | 221.65  | 14.42  |
| GreenLand_1 | 74.69      | -42.50     | Outer | DSC  | Fore    | -10.33     | -8.68      | -9.65       | 0.53       | 198.71 | 239.07 | 217.65  | 11.91  |
| Amazon_2    | -3.00      | -61.00     | Outer | DSC  | Aft     | -10.58     | -8.00      | -9.61       | 0.48       | 239.00 | 315.38 | 279.47  | 17.12  |
| Amazon_2    | -3.00      | -61.00     | Outer | DSC  | Fore    | -11.36     | -8.39      | -9.65       | 0.58       | 227.00 | 322.49 | 274.38  | 17.70  |
| Amazon_1    | 0.00       | -67.00     | Outer | DSC  | Aft     | -10.16     | -7.64      | -8.79       | 0.46       | 241.15 | 334.23 | 282.77  | 16.43  |
| Amazon_1    | 0.00       | -67.00     | Outer | DSC  | Fore    | -9.97      | -7.51      | -8.63       | 0.55       | 239.29 | 302.29 | 272.31  | 15.47  |



## 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    | 318.41 | 0.46 | 4.434        | 0.12     | 281.86 | 0.43 | 3.870        | 0.12     | 1.21  | 0.12  | 0.002        | 0.12      | 0.31  | 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>      | -34.95  | 22.73  | 5.12 | 0.008        | -34.64   | 23.10  | 5.27 | 0.027        | -10.63   | 29.40 | 19.62 | 23.228       | -3.30     | 30.51 | 20.66 | 40.245       |

| 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    | 213.77 | 0.35 | 3.741        | 0.09     | 224.34 | 0.37 | 3.882        | 0.09     | 0.17  | 0.09  | 0.000        | 0.09      | 8.46  | 0.09  | 0.002        |
| <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>      | -34.60  | 21.73  | 3.16 | 0.000        | -34.81   | 21.54  | 2.71 | 0.000        | -1.03    | 22.83 | 13.89 | 0.042        | -20.54    | 24.32 | 14.57 | 1.438        |

| 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> | 48.76           | 49.43   | 49.04   | 0.000        | 57.59           | 58.27   | 57.94   | 0.000        | Inci.(Inner)             | 47.10   | 49.90   |
| <b>Azimuth Diff. (deg)</b>   | 0.0000          | 210.76  | 1.27    | 2.768        | 0.0000          | 299.14  | 1.28    | 3.758        | Inci.(Outer)             | 57.30   | 58.90   |
| <b>Range(Km)</b>             | 1039.32         | 1076.24 | 1052.76 | 0.000        | 1218.33         | 1265.05 | 1236.05 | 0.000        | Azimuth Diff.            | 0.60    | 2.00    |
| <b>X Factor(dbm)</b>         | -91.75          | -89.87  | -90.37  | 0.000        | -93.75          | -91.92  | -92.14  | 0.000        | Range(Inner)             | 1025.00 | 1095.70 |
| <b>Across Distance (Km)</b>  | 15.60           | 16.16   | 15.80   | 0.000        | 11.41           | 36.06   | 21.01   | 7.000        | Range(Outer)             | 1210.00 | 1280.00 |
| <b>Along Distance (Km)</b>   | 18.98           | 8528.39 | 37.11   | 3.000        | 18.75           | 8347.11 | 36.91   | 5.000        | 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   |
|                              |                 |         |         |              |                 |         |         |              |                          |         |         |

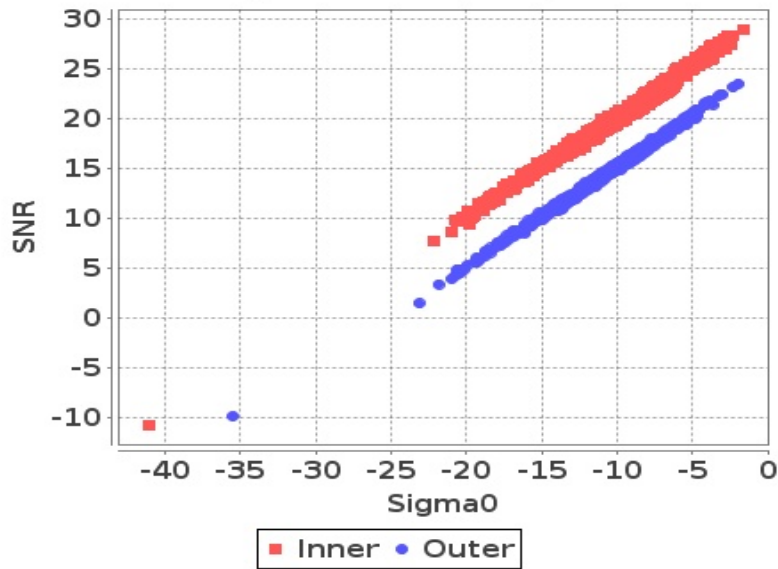
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

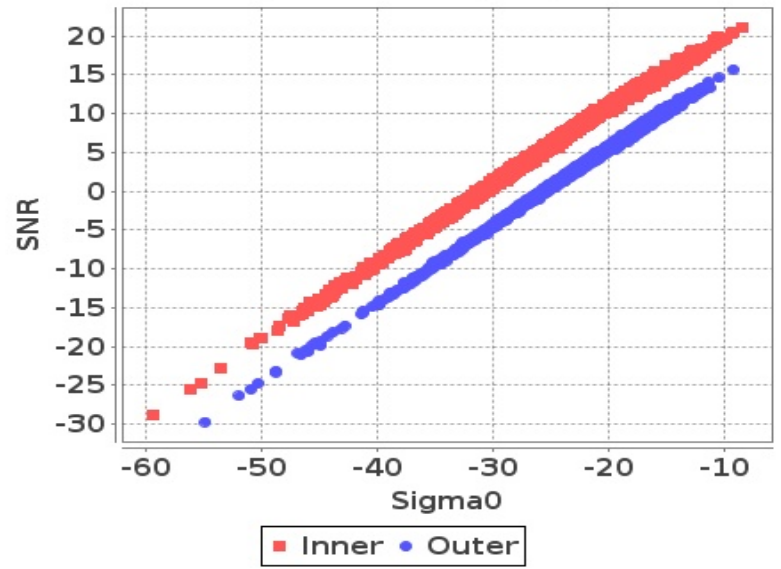
Footprint-Land

Sigma0 Vs SNR (Land)



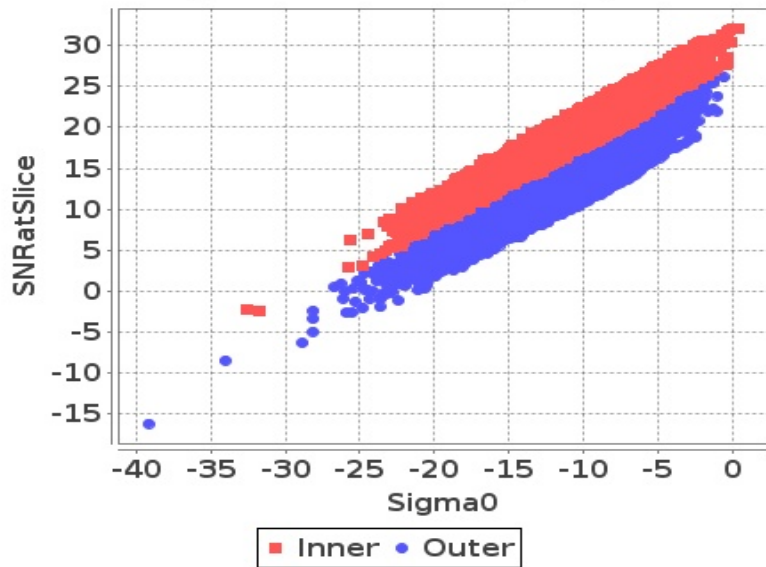
Footprint-Sea

Sigma0 Vs SNR (Sea)



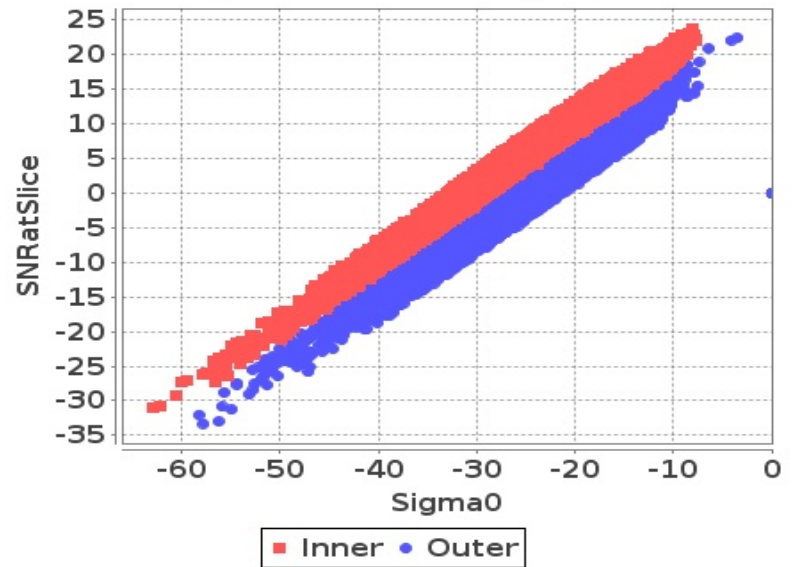
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

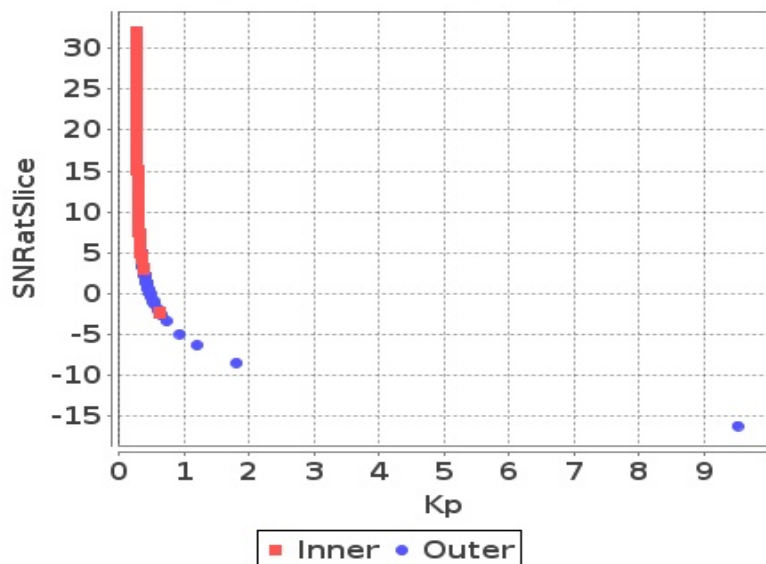
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

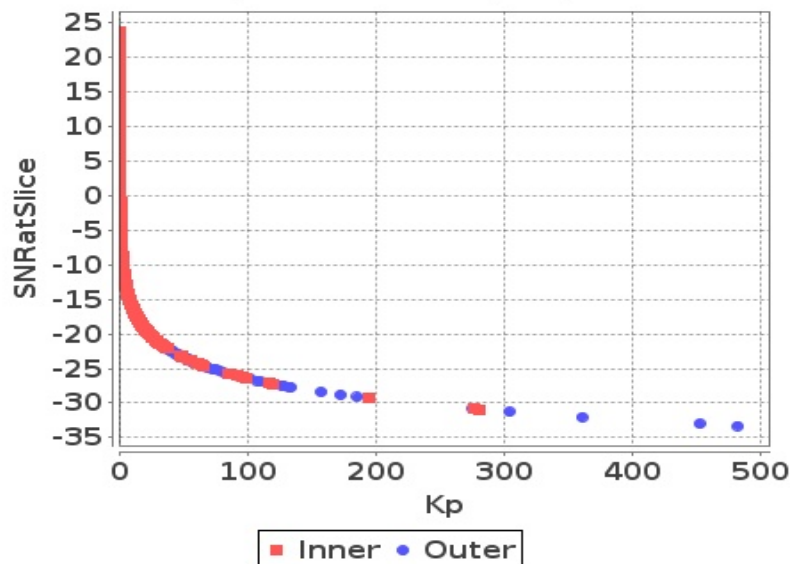
Slice

Kp Vs SNRatSlice (Land)



Slice

Kp Vs SNRatSlice (Sea)

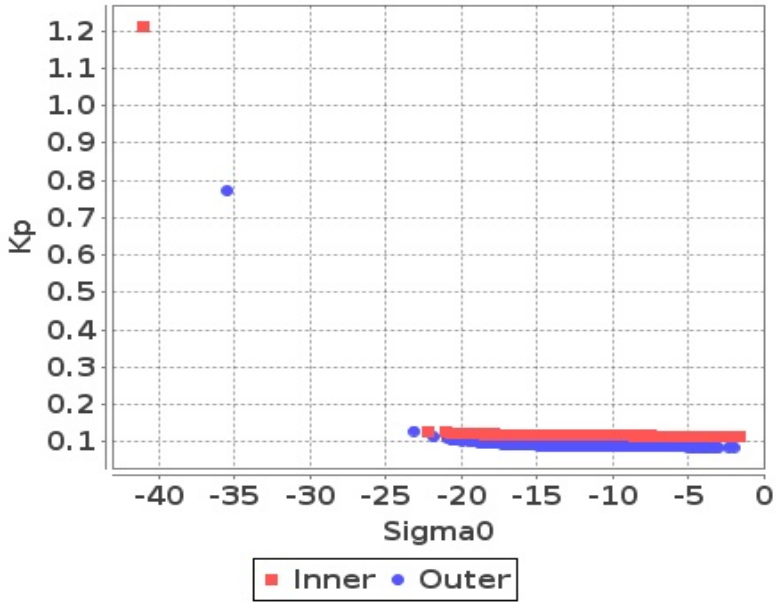




# Sigma0 Behaviour(Sigma0 Vs Kp)

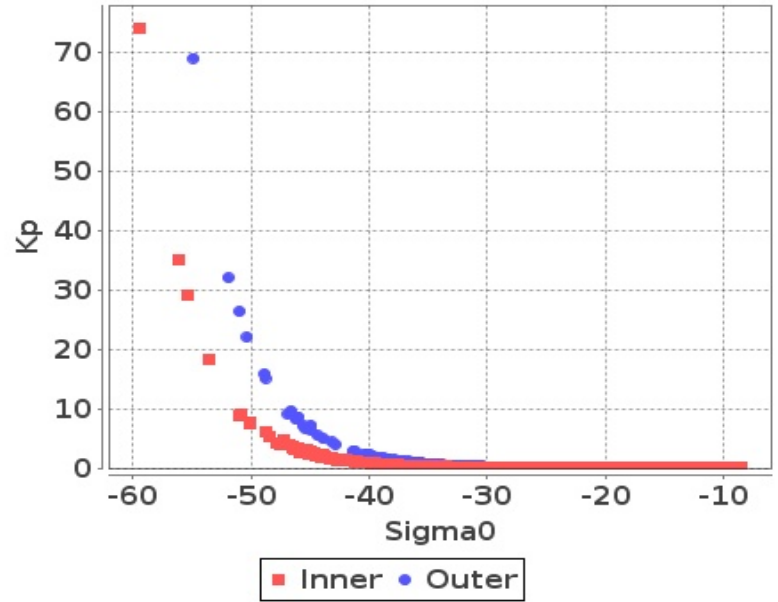
## Footprint-Land

### Sigma0 Vs Kp (Land)



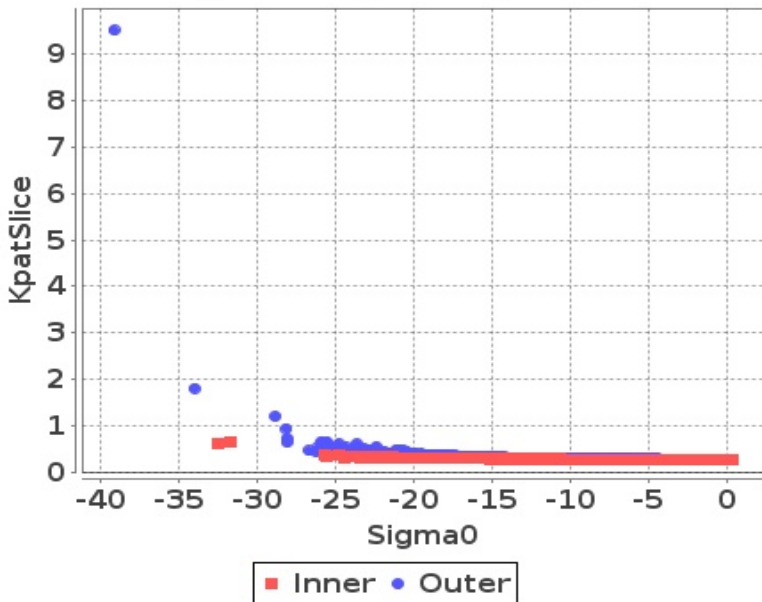
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



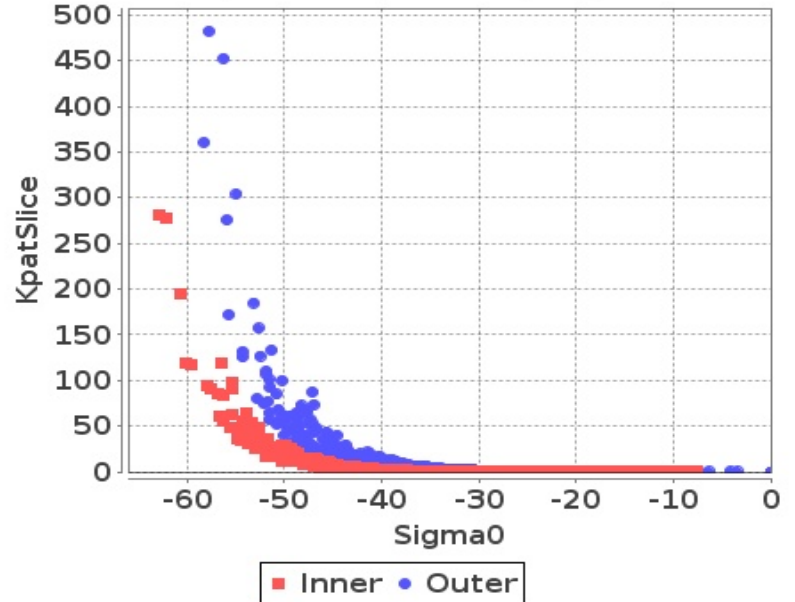
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

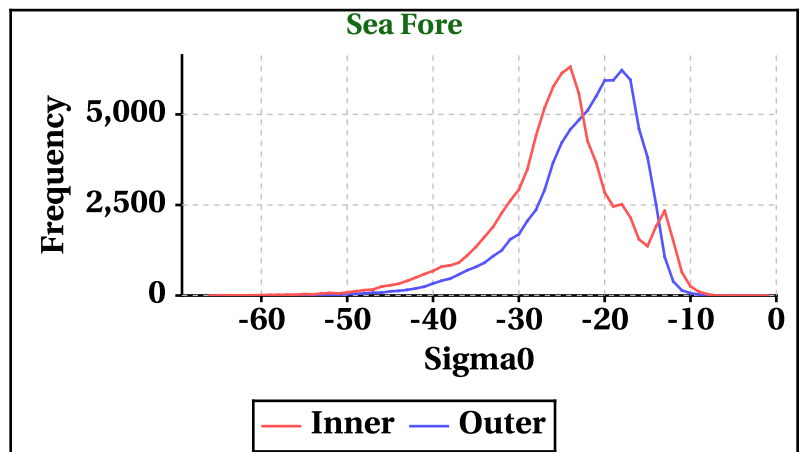
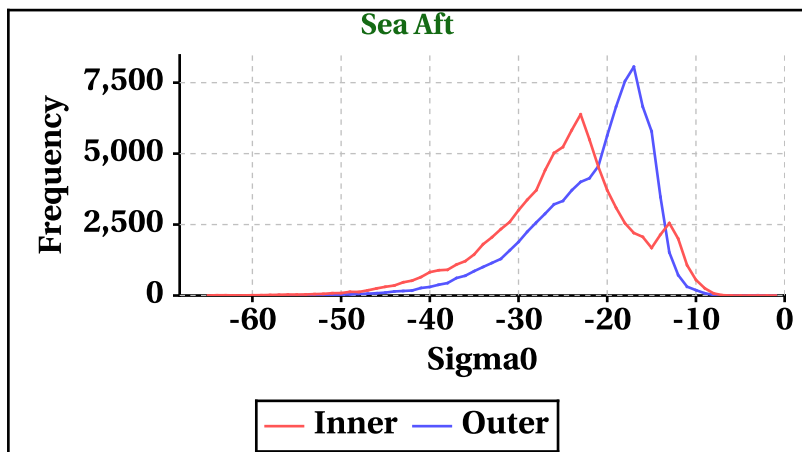
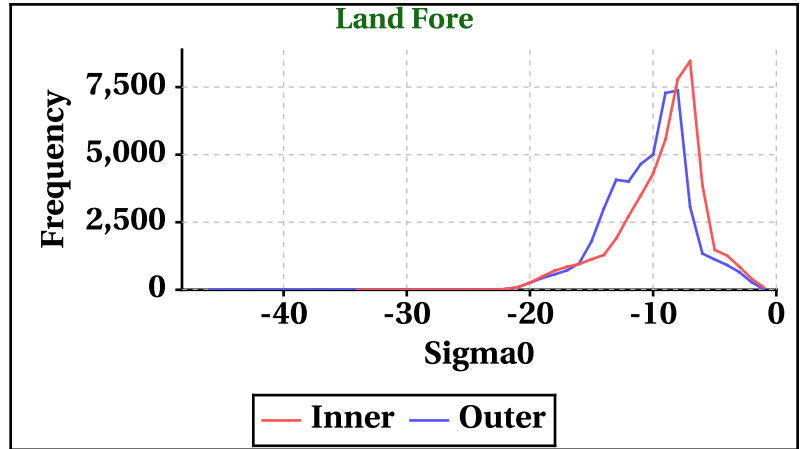
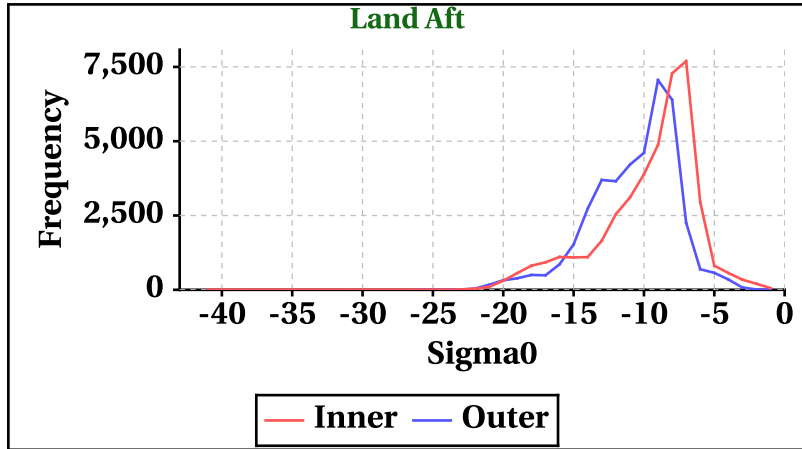


# Dynamic Range (Data Histograms)

## Sigma0(db)

| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -41      | -34       | -65     | -66      |
| Max             | 0        | 0         | 0       | 0        |

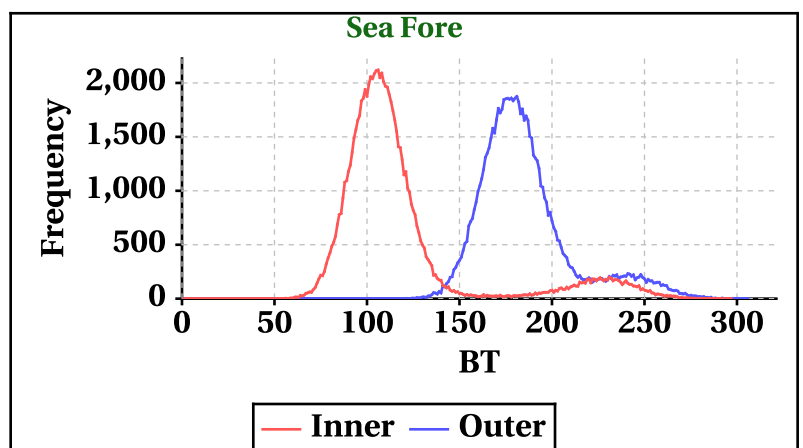
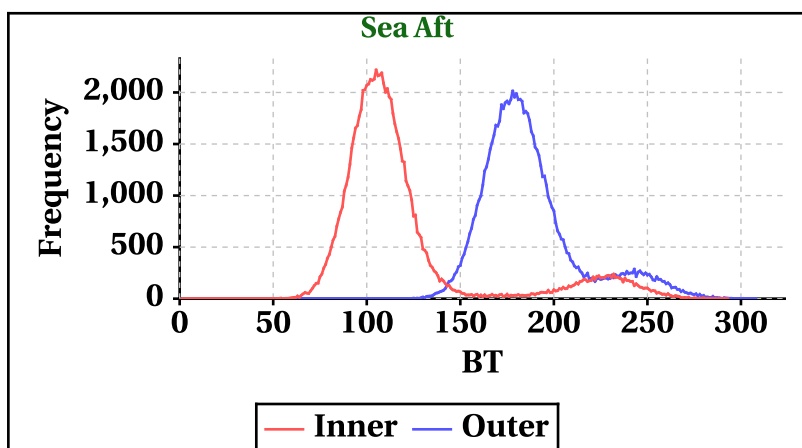
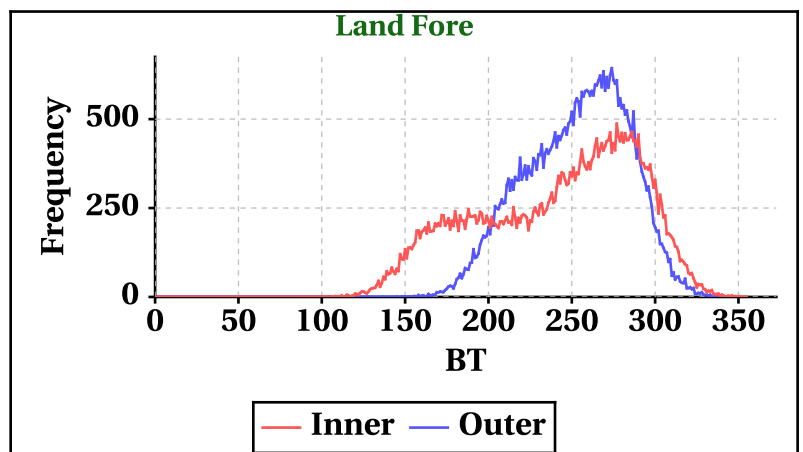
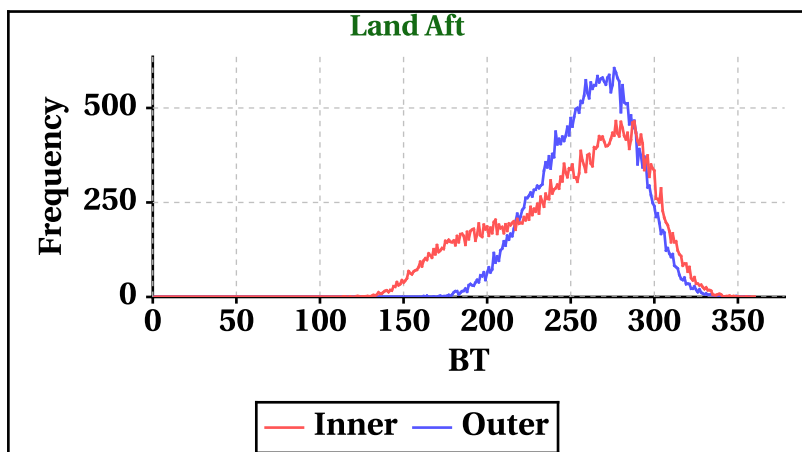
| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -26      | -46       | -59     | -60      |
| Max             | 0        | 0         | 0       | 0        |



## Brightness Temperature(K)

| Inner Beam(HH) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 360      | 355       | 293     | 297      |

| Outer Beam(VV) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 357      | 348       | 308     | 306      |

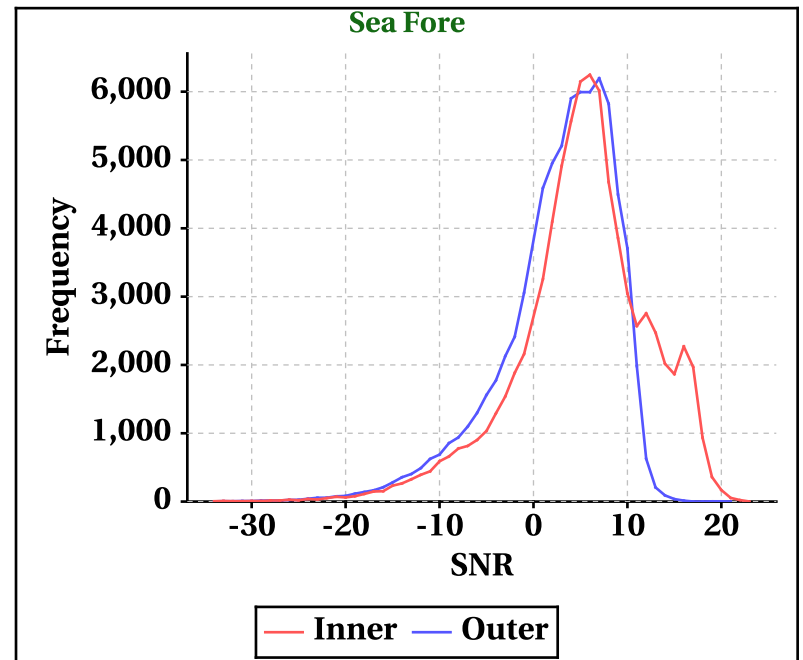
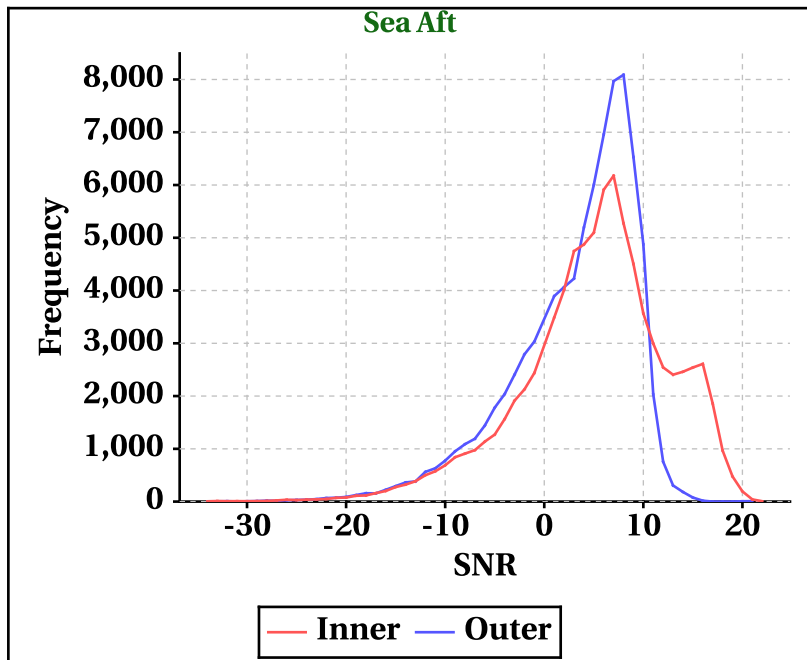
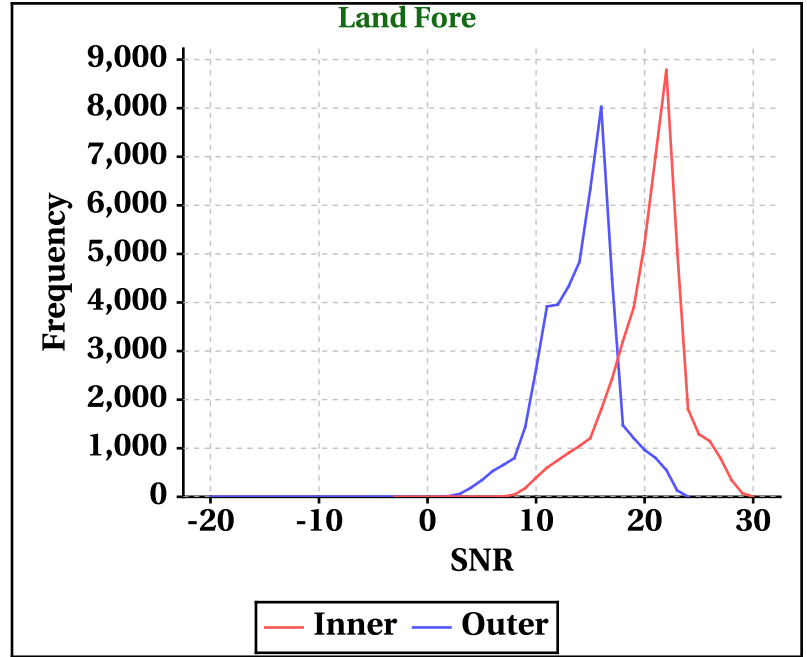
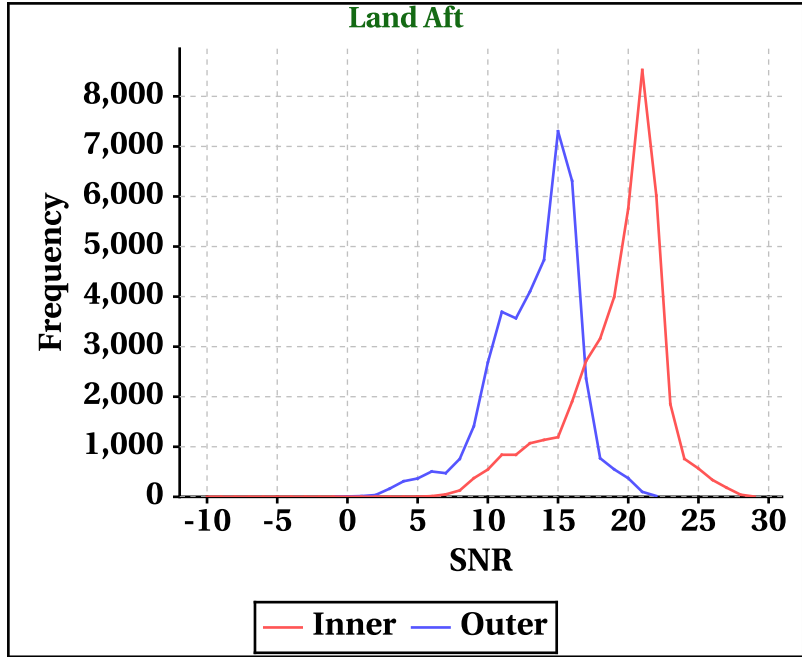


# Dynamic Range (Data Histograms)

## SNR(dBm)

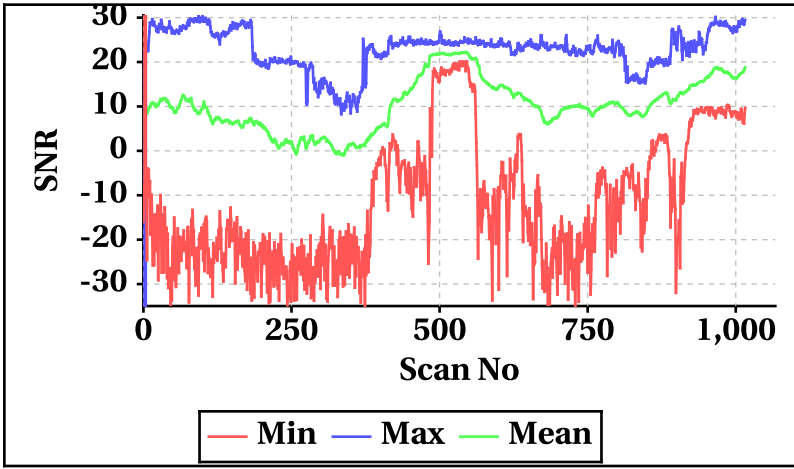
| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -10      | -3        | -34     | -34      |
| Max             | 29       | 30        | 22      | 23       |

| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -1       | -20       | -34     | -34      |
| Max             | 22       | 24        | 21      | 21       |

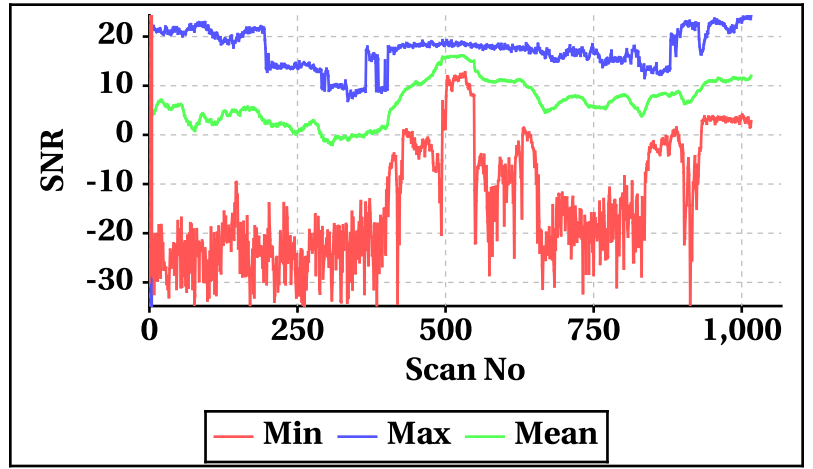


## Orbit-wise behaviour of SNR

Inner Beam (HH)

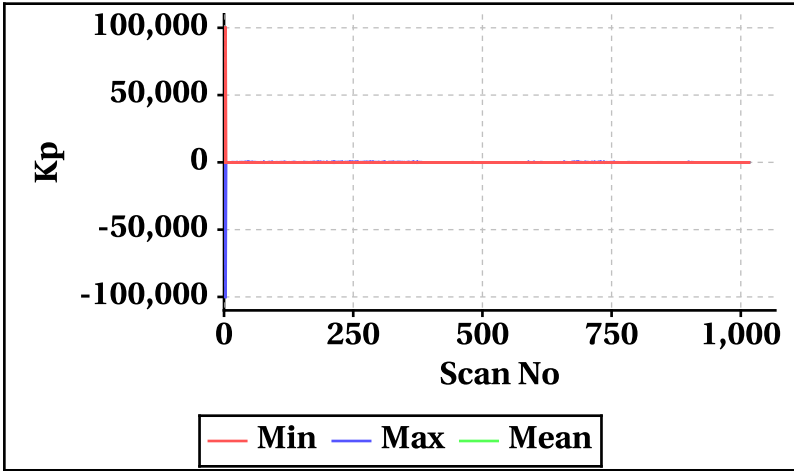


Outer Beam(VV)

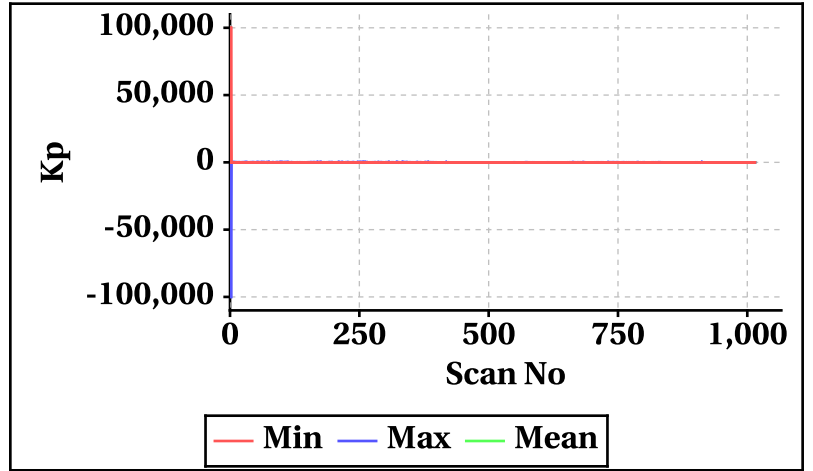


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

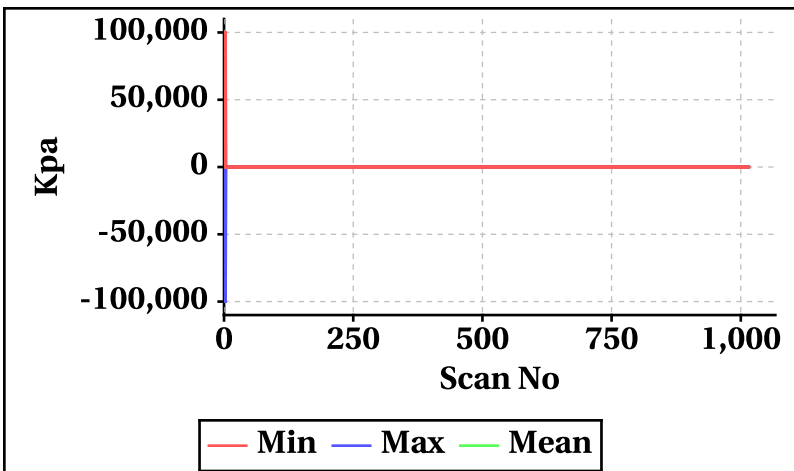
Inner Beam(HH)



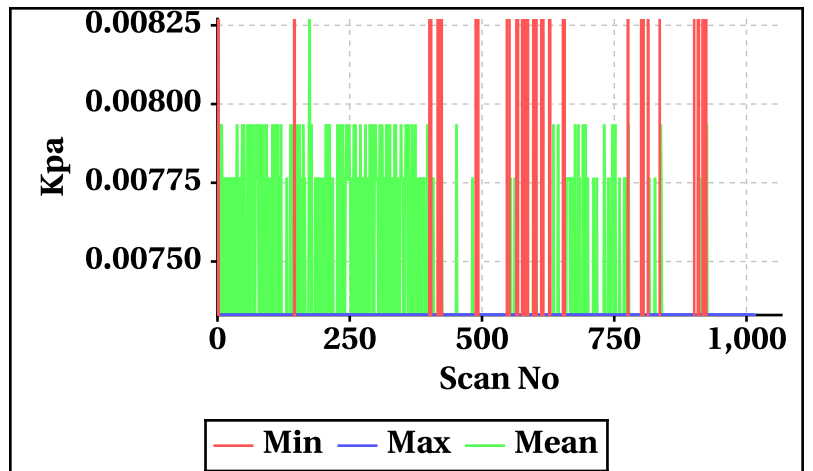
Outer Beam(VV)



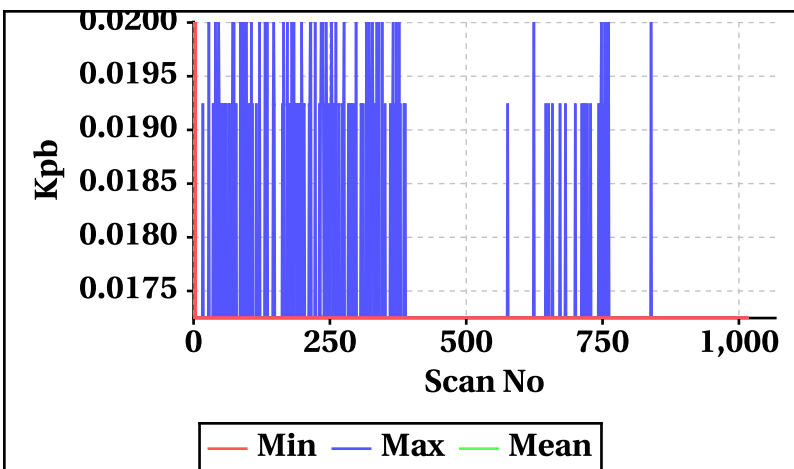
Inner Beam(HH)



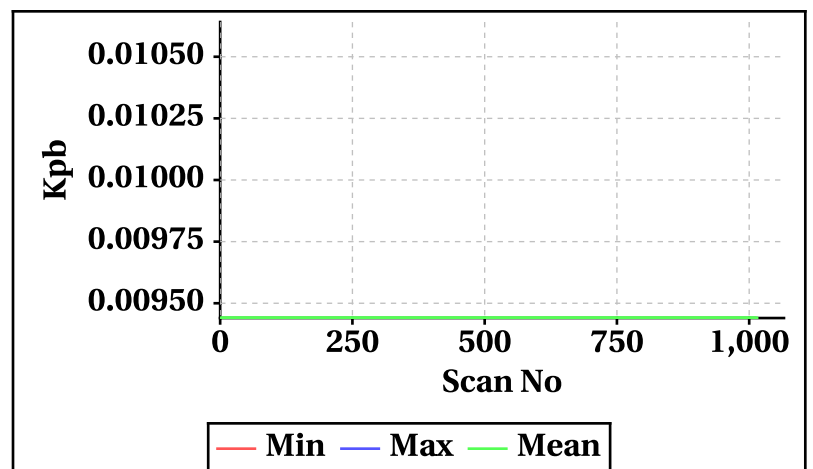
Outer Beam(VV)



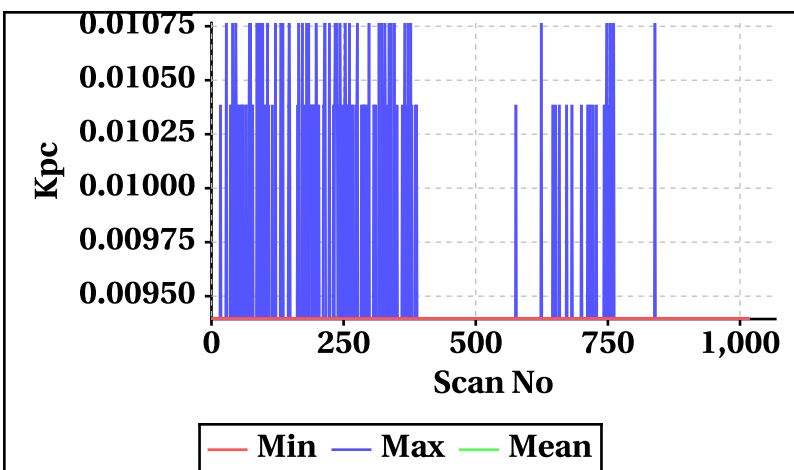
Inner Beam(HH)



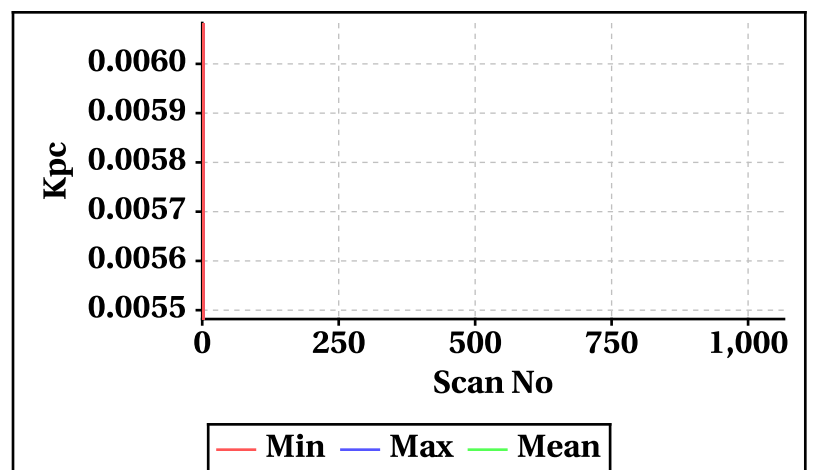
Outer Beam(VV)



Inner Beam(HH)



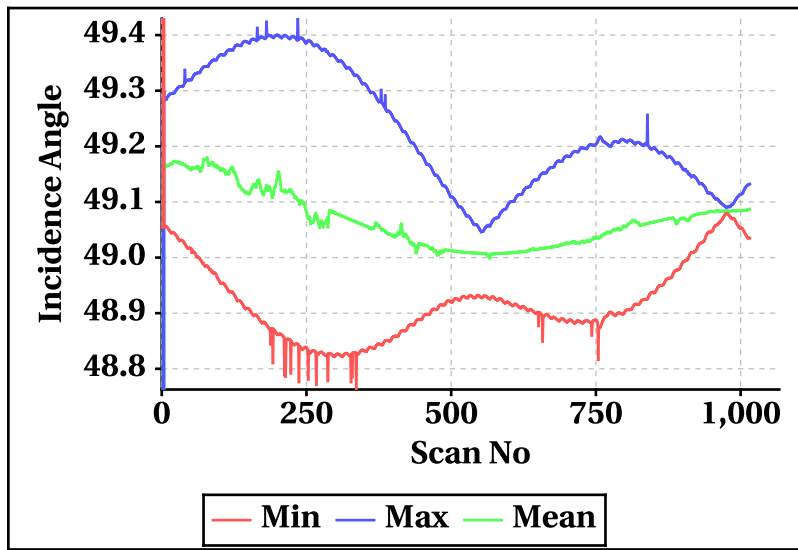
Outer Beam(VV)



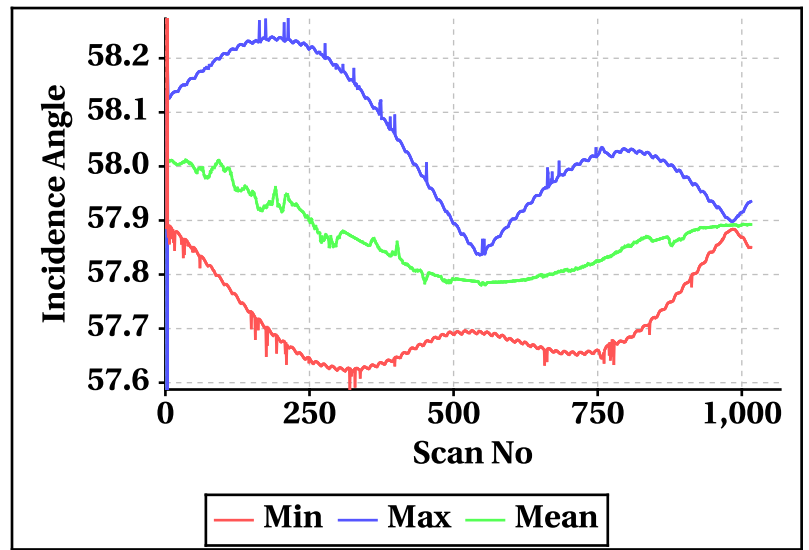


# Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

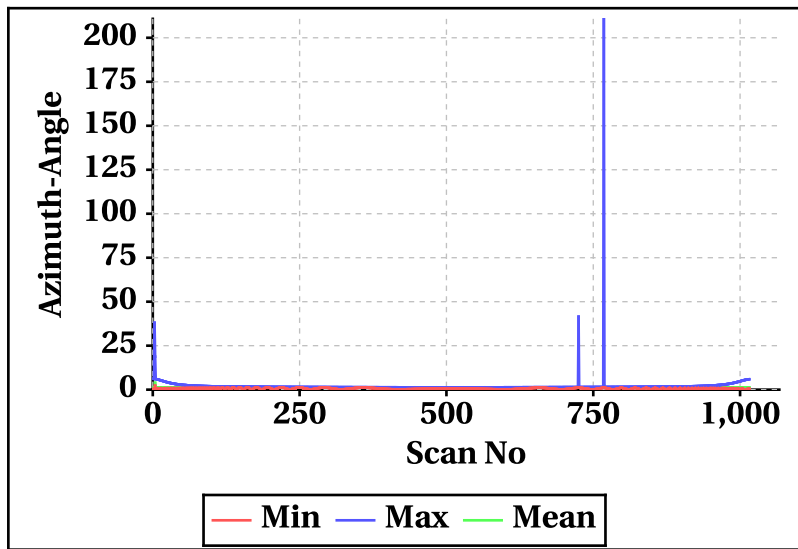
**Inner Beam (HH)**



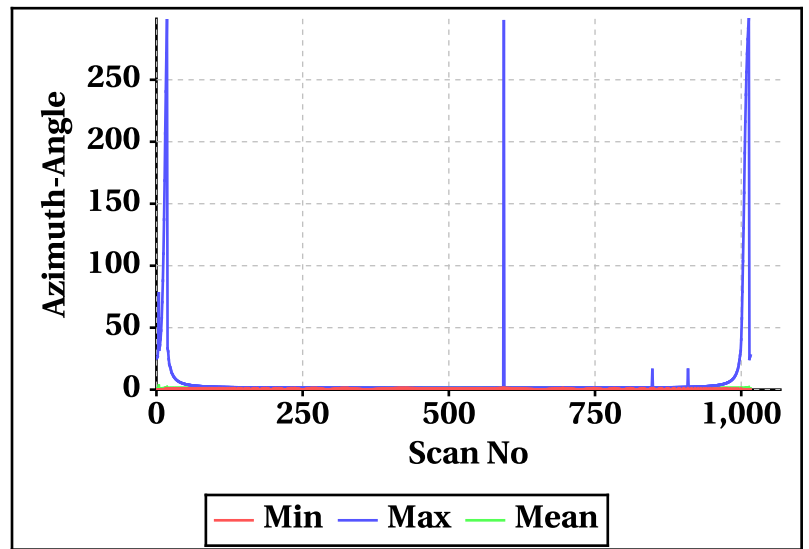
**Outer Beam(VV)**



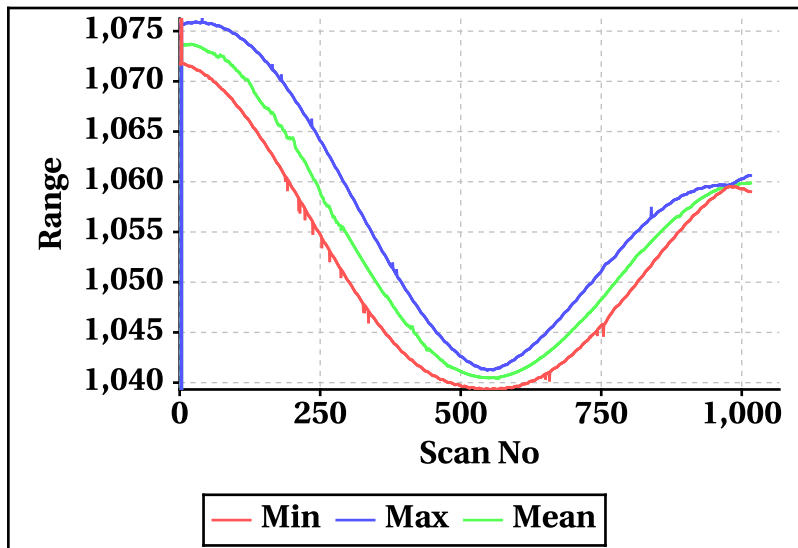
**Inner Beam (HH)**



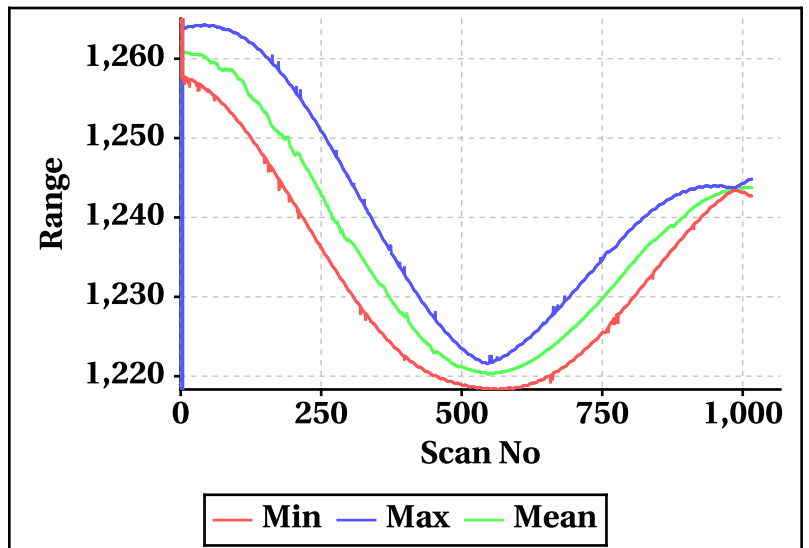
**Outer Beam(VV)**



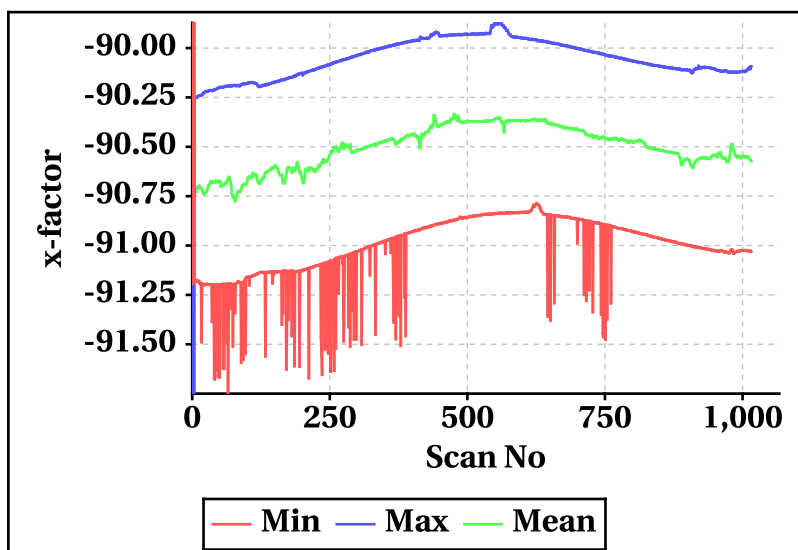
**Inner Beam (HH)**



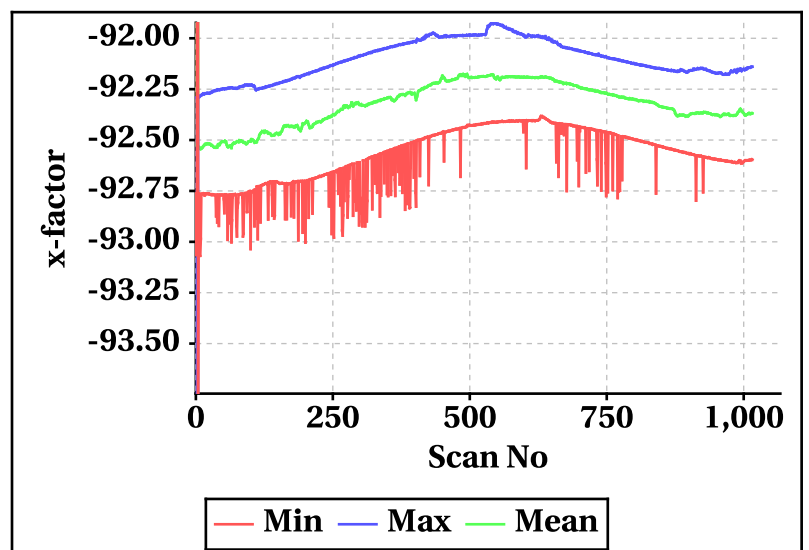
**Outer Beam(VV)**



**Inner Beam (HH)**



**Outer Beam(VV)**

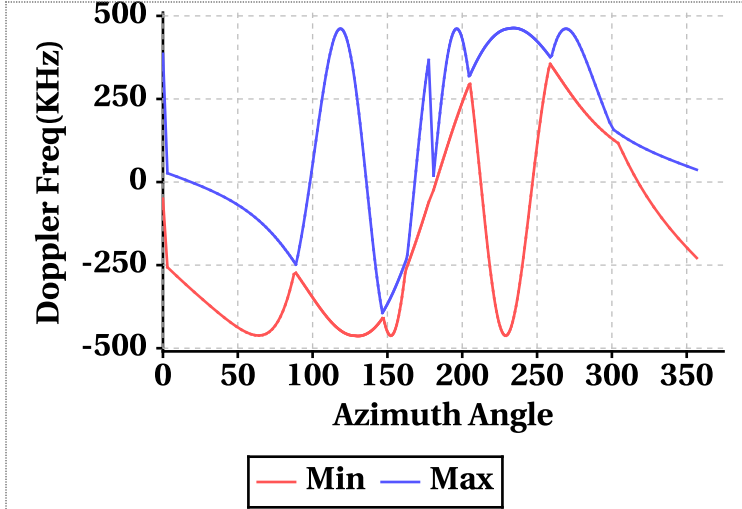


# Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

|     | Inner Beam (HH) | Outer Beam (VV) |
|-----|-----------------|-----------------|
| Min | -463.22         | -519.12         |
| Max | 463.36          | 519.24          |

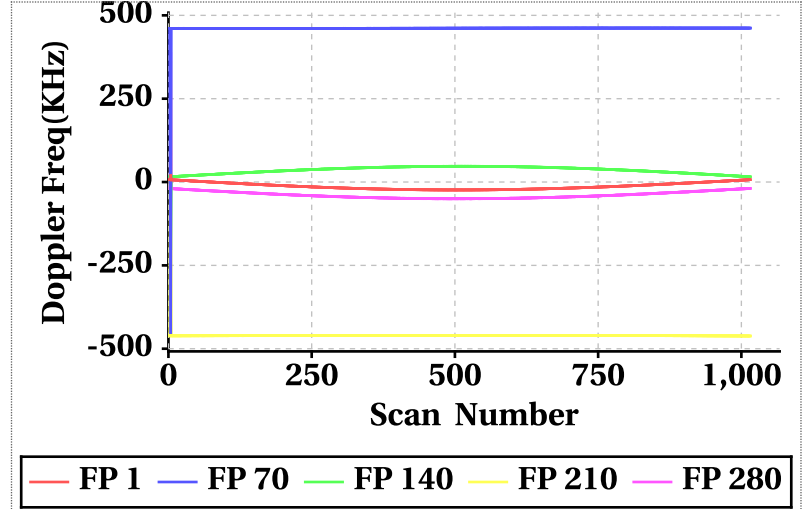
Footprint wise Doppler frequency variation Inner Beam (HH)



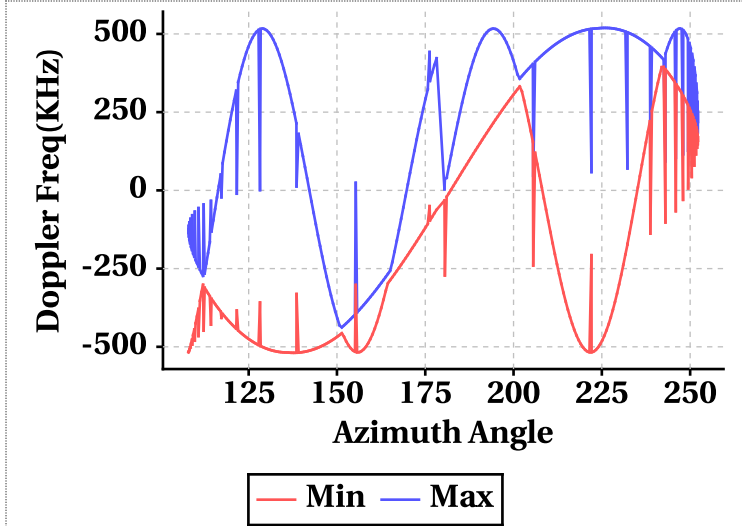
Doppler Frequency(KHz) variation

| Doppler_FP  | Inner Beam (HH) |        |         | Outer Beam (VV) |        |         |
|-------------|-----------------|--------|---------|-----------------|--------|---------|
|             | Min             | Max    | Mean    | Min             | Max    | Mean    |
| Doppler_1   | -23.70          | 19.46  | -12.43  | -32.22          | 3.72   | -19.57  |
| Doppler_70  | -451.88         | 461.88 | 460.03  | -509.80         | 517.38 | 515.20  |
| Doppler_140 | -199.64         | 47.26  | 35.47   | -240.10         | 47.10  | 33.92   |
| Doppler_210 | -461.82         | 357.52 | -459.30 | -517.76         | 388.90 | -515.24 |
| Doppler_280 | -50.18          | 385.78 | -38.42  | -50.40          | 442.24 | -37.19  |

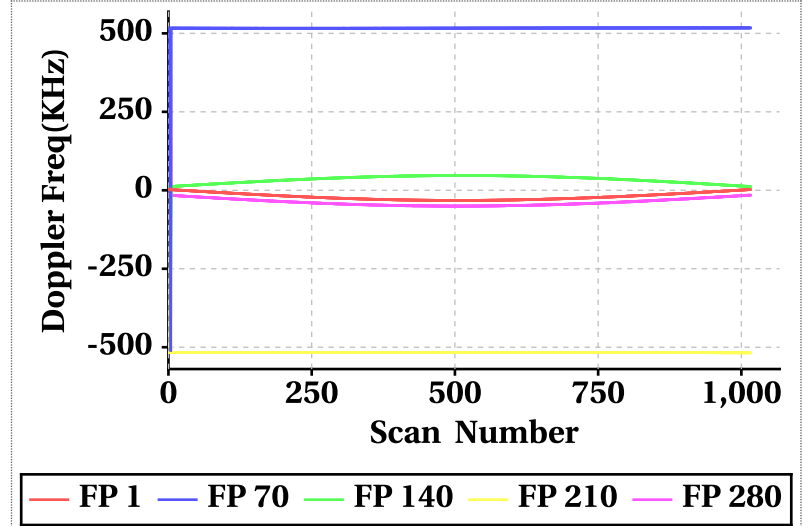
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

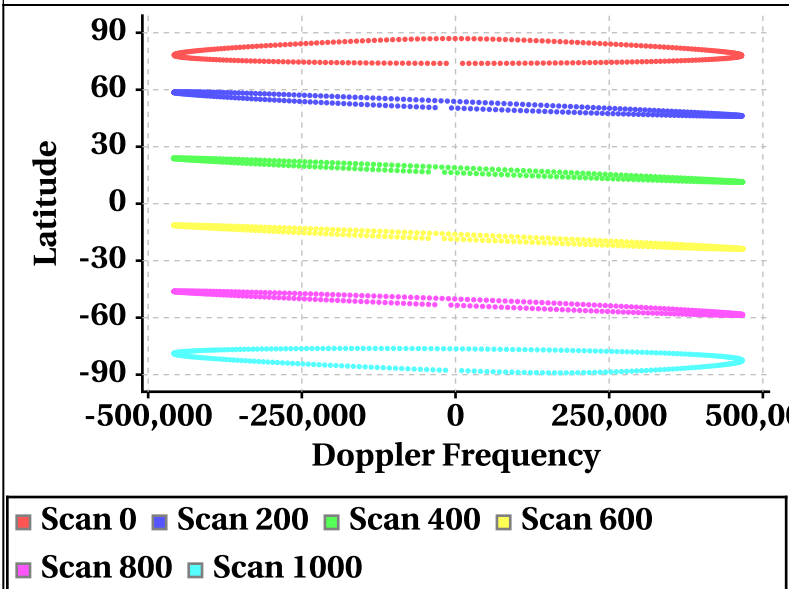


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

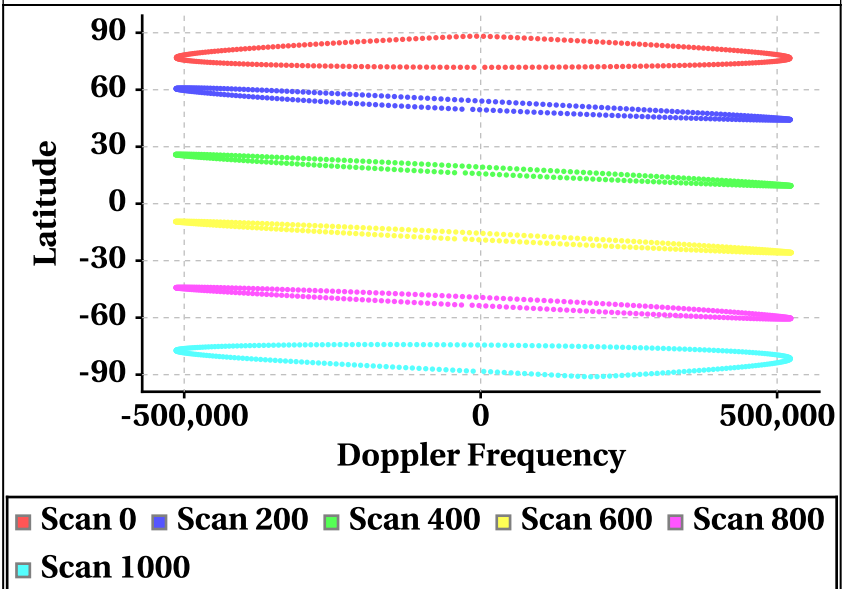


# Latitude Vs Doppler Frequency

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



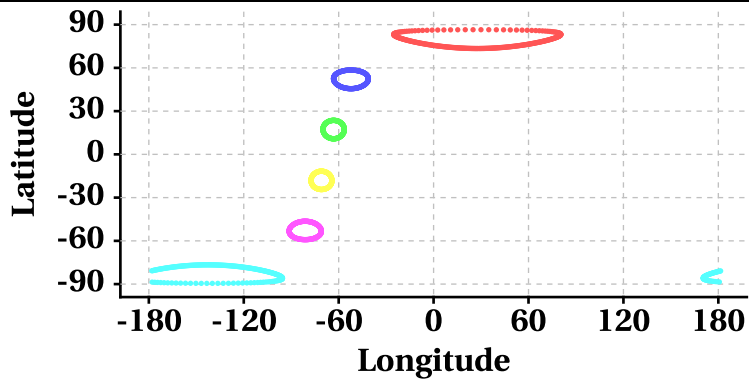
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

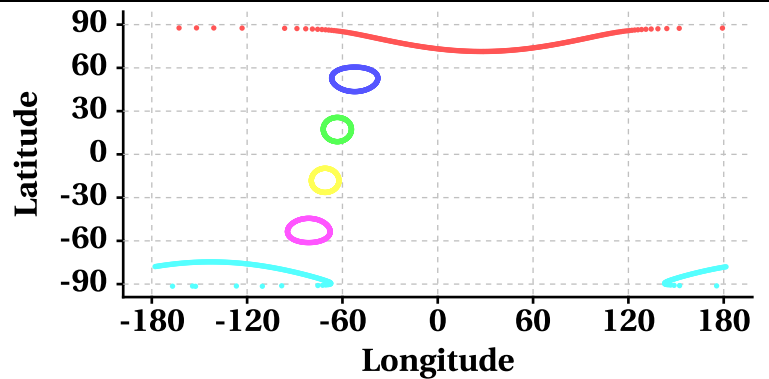
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

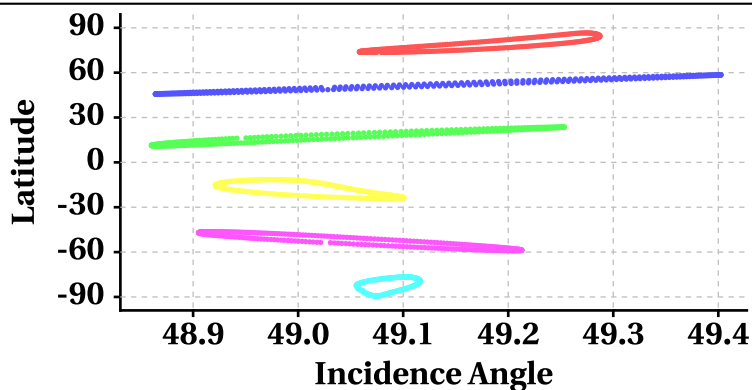
Scan Trace [Outer Beam (VV)]



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

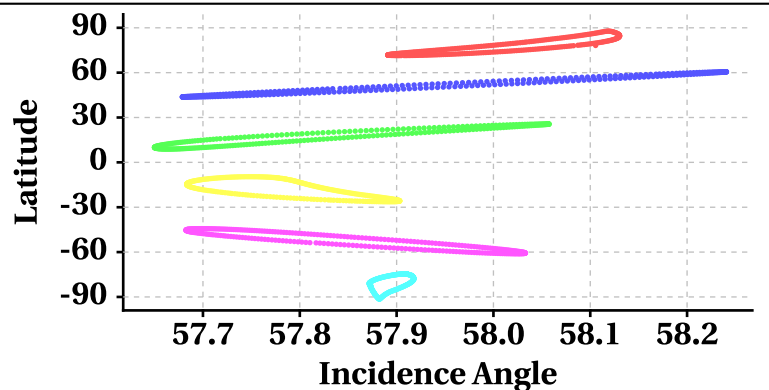
## Latitude Vs Incidence Angle

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



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

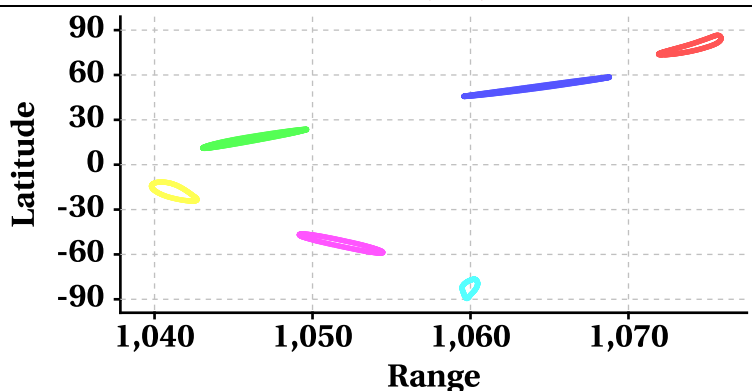
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

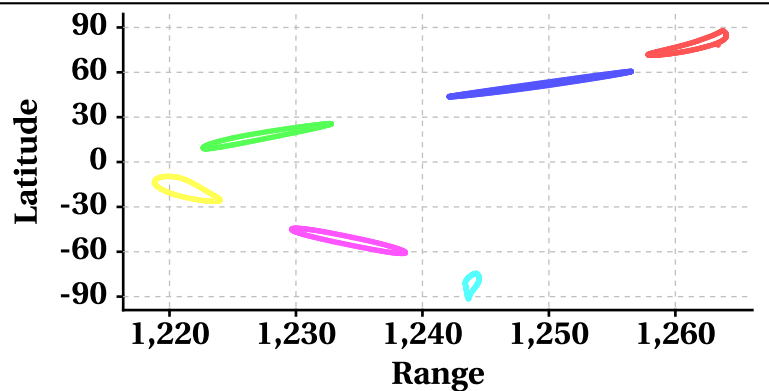
## Latitude Vs Range

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

