

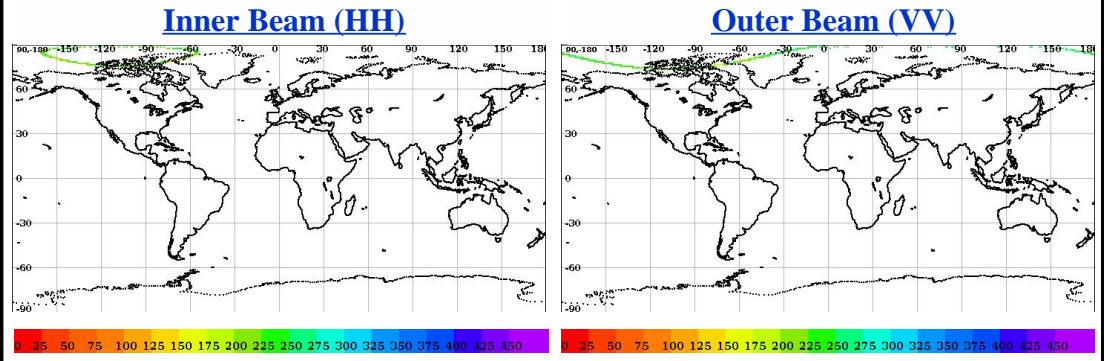
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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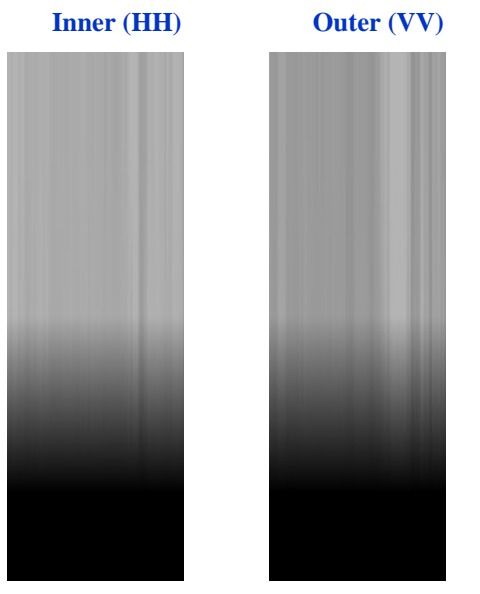
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|                              |               |                              |              |                               |     |
|------------------------------|---------------|------------------------------|--------------|-------------------------------|-----|
| <b>Satellite Id</b>          | ScatSat-1     | <b>Start Orbit</b>           | 4070         | <b>Total Scans</b>            | 2   |
| <b>Sensor Name</b>           | Scatterometer | <b>End Orbit</b>             | 4071         | <b>No of Inner FootPrints</b> | 281 |
| <b>Processor Version</b>     | v1.1.2        | <b>Rev. Number</b>           | 04070_04071  | <b>No Of Outer FootPrints</b> | 282 |
| <b>Half Orbit Direction</b>  | NS            | <b>Data Production Date</b>  | 03-07-2017   | <b>No. Of Inner Slices</b>    | 9   |
| <b>Equator Crossing Date</b> | 03-07-2017    | <b>Equator Crossing Time</b> | 22:15:04.000 | <b>No Of Outer Slices</b>     | 14  |

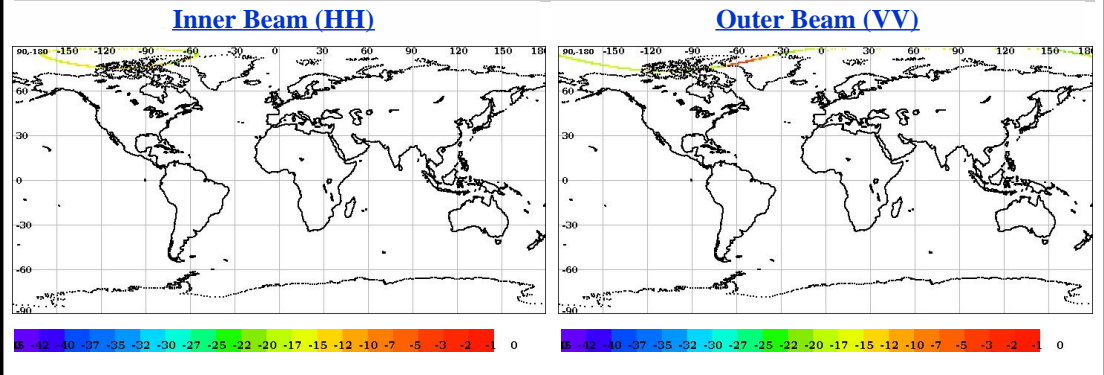
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace

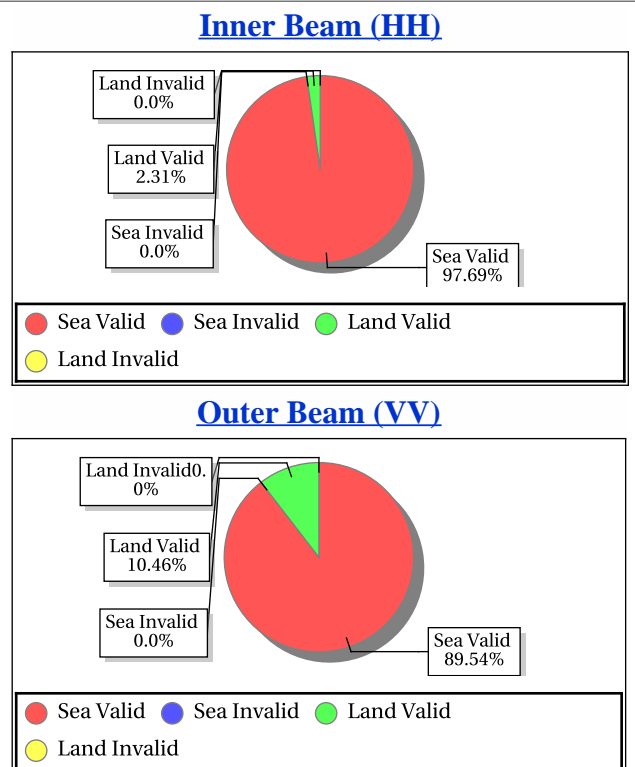


## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

| Sigma-0 Flags                            | Inner Beam | Outer Beam |
|--|------------|------------|
| Invalid Sigma0(%)                        | 0.00       | 0.00       |
| Data Not Available From Payload (%)      | 0.0        | 0.0        |
| 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 (-96dB) (%)         | 0.0        | 0.0        |
| Sigma0 > upper bound (0 dB) (%)          | 0.00       | 0.00       |
| SNR < -65 dB (%)                         | 0.0        | 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. (%) |
| Kp  | 0.11            | 0.11  | 0.11  | 0.000        | 0.10     | 0.11  | 0.11  | 0.000        | 0.10     | 0.11  | 0.10  | 0.000        | 0.10      | 0.10  | 0.10  | 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 | 9.05            | 13.12 | 11.37 | 0.000        | 11.31    | 17.41 | 13.87 | 0.000        | 12.74    | 18.42 | 14.95 | 0.000        | 17.21     | 17.21 | 17.21 | 0.000        |

|     | 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            | 0.12 | 0.10 | 0.000        | 0.09     | 0.11 | 0.09 | 0.000        | 0.08     | 0.09  | 0.08  | 0.000        | 10000.00  | -10000.00 | 0.00 | 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        | 10000.00  | -10000.00 | 0.00 | 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        | 10000.00  | -10000.00 | 0.00 | 0.000        |
| Kpc | 0.00            | 0.00 | 0.00 | 0.000        | 0.00     | 0.00 | 0.00 | 0.000        | 0.00     | 0.00  | 0.00  | 0.000        | 10000.00  | -10000.00 | 0.00 | 0.000        |
| SNR | 2.39            | 8.03 | 6.15 | 0.000        | 2.90     | 9.52 | 7.10 | 0.000        | 9.89     | 22.15 | 19.52 | 1.695        | 10000.00  | -10000.00 | 0.00 | 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) | 48.92           | 49.09        | 49.03   | 0.000        | 57.73           | 57.91   | 57.84   | 0.000        | Inci.(Inner)             | 47.10   | 49.90   |
| Azimuth Diff. (deg)   | 100000.0000     | -100000.0000 | 0.00    | 0.000        | 0.6177          | 0.63    | 0.16    | 0.000        | Inci.(Outer)             | 57.30   | 58.90   |
| Range(Km)             | 1044.22         | 1047.02      | 1046.13 | 0.000        | 1225.05         | 1229.62 | 1227.97 | 0.000        | Azimuth Diff.            | 0.60    | 2.00    |
| X Factor(dbm)         | -91.22          | -89.30       | -89.97  | 0.000        | -93.00          | -91.71  | -92.22  | 0.000        | Range(Inner)             | 1025.00 | 1095.70 |
| Across Distance (Km)  | 15.37           | 15.89        | 15.59   | 0.000        | 9.65            | 35.29   | 20.61   | 7.000        | Range(Outer)             | 1210.00 | 1280.00 |
| Along Distance (Km)   | 20.04           | 20.04        | 10.02   | 0.000        | 20.02           | 20.02   | 10.01   | 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   |
|                       |                 |              |         |              |                 |         |         |              |                          |         |         |

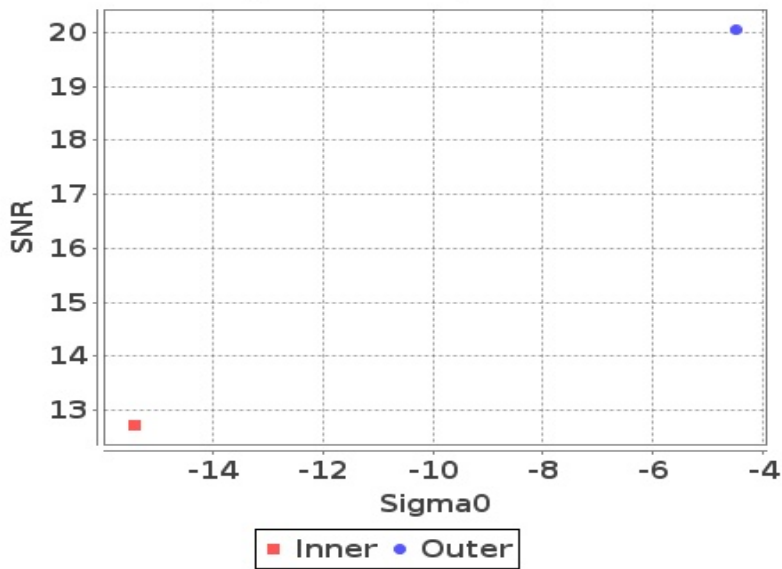
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

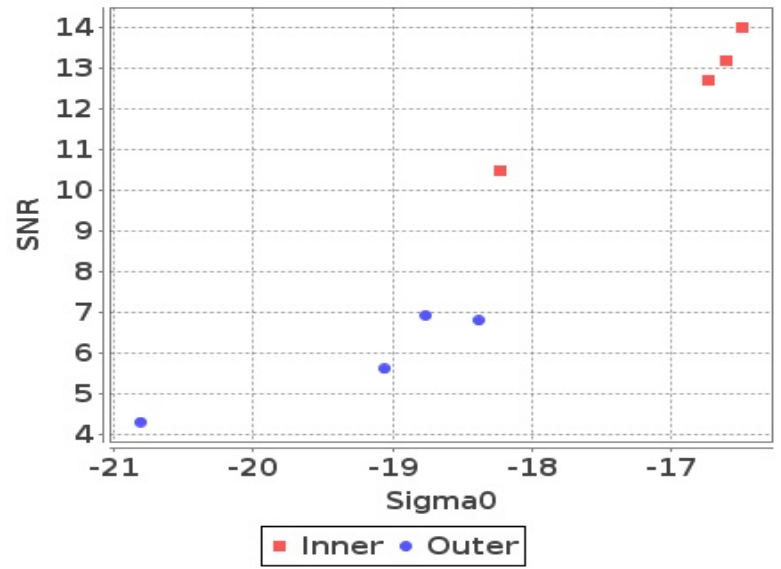
Footprint-Land

Sigma0 Vs SNR (Land)



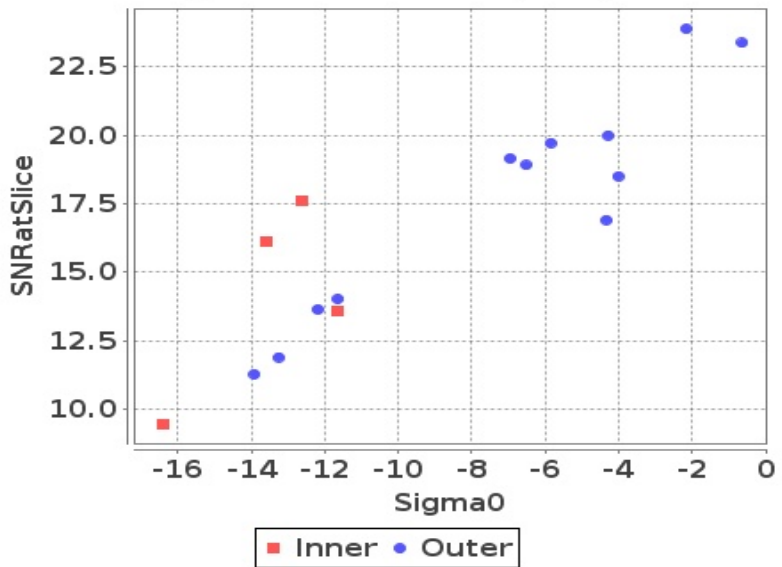
Footprint-Sea

Sigma0 Vs SNR (Sea)



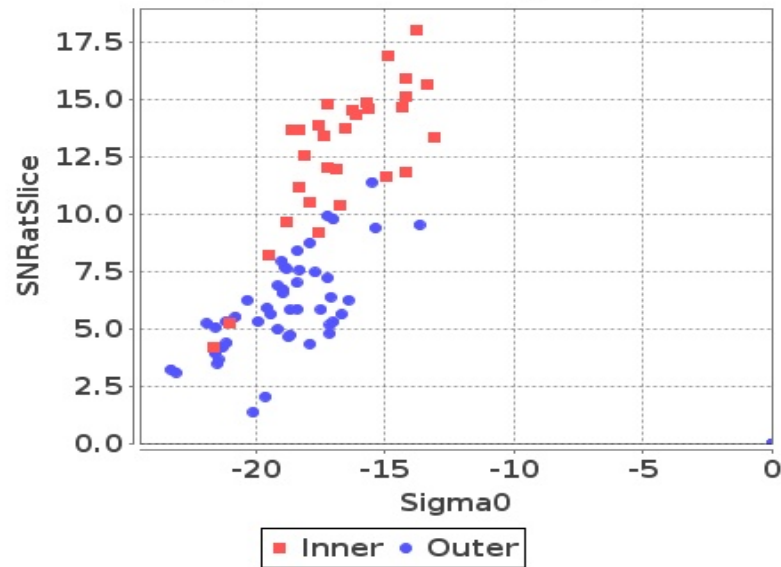
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

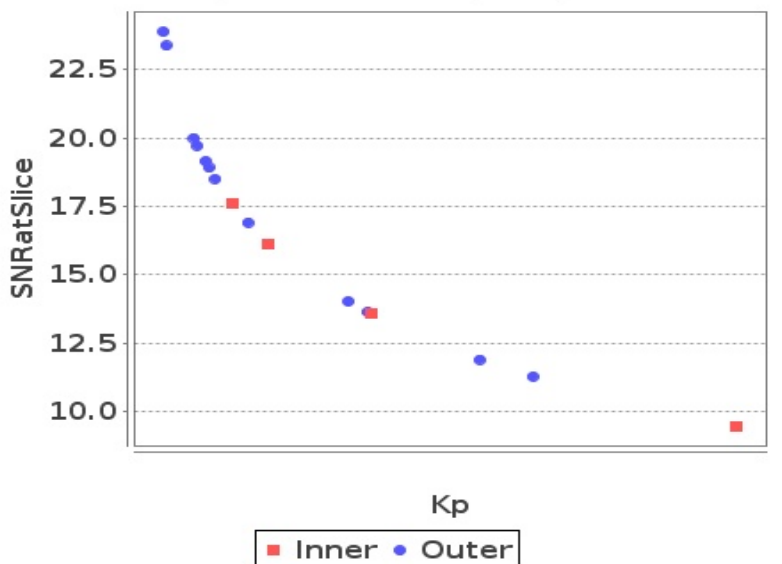
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

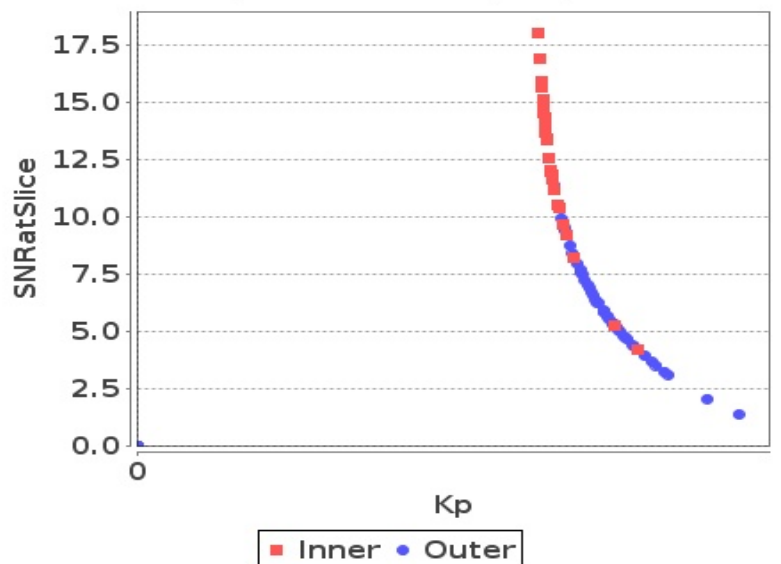
Slice

Kp Vs SNRatSlice (Land)



Slice

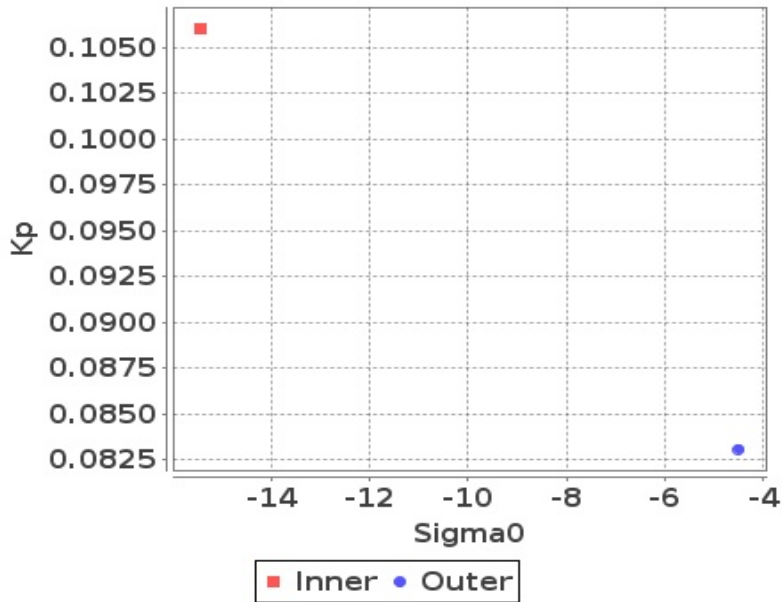
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

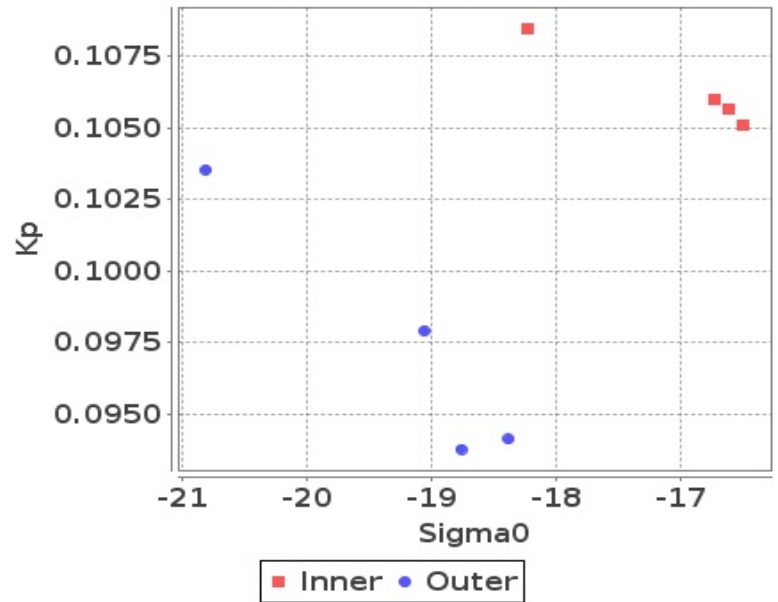
## Footprint-Land

### Sigma0 Vs Kp (Land)



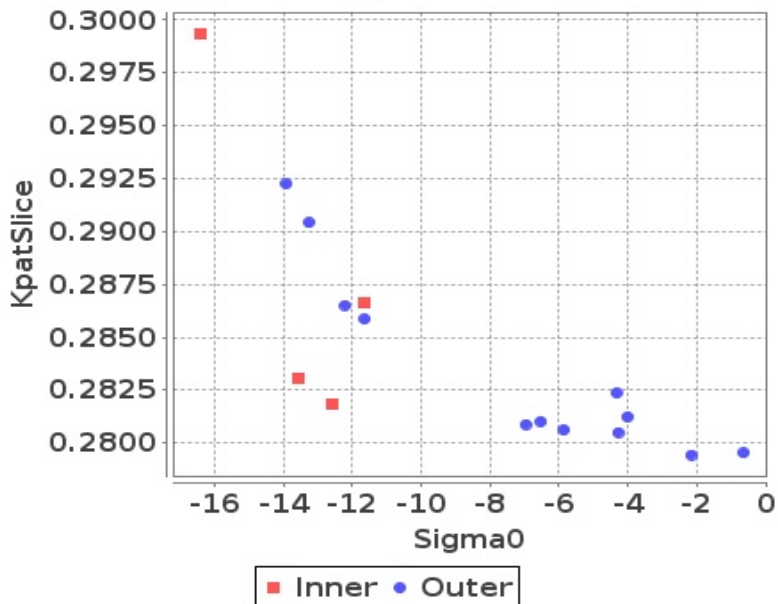
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



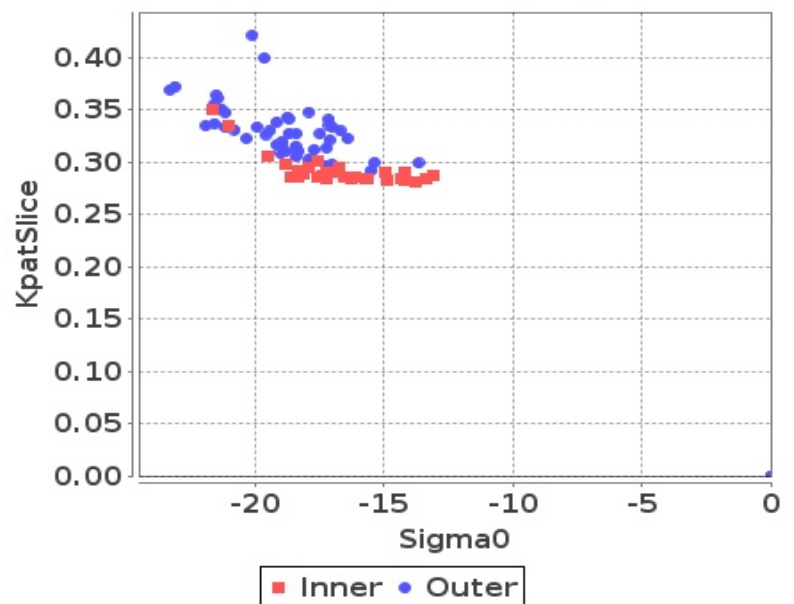
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

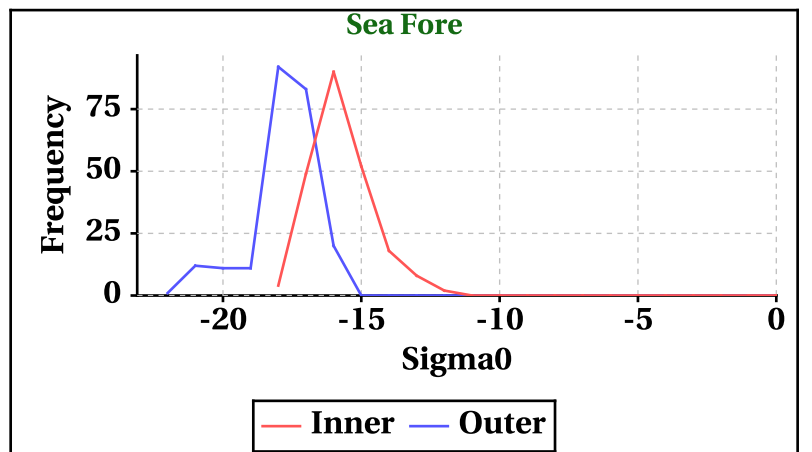
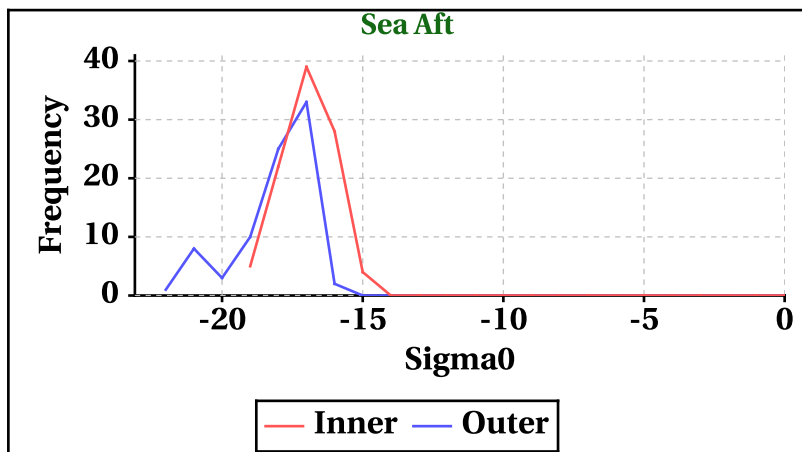
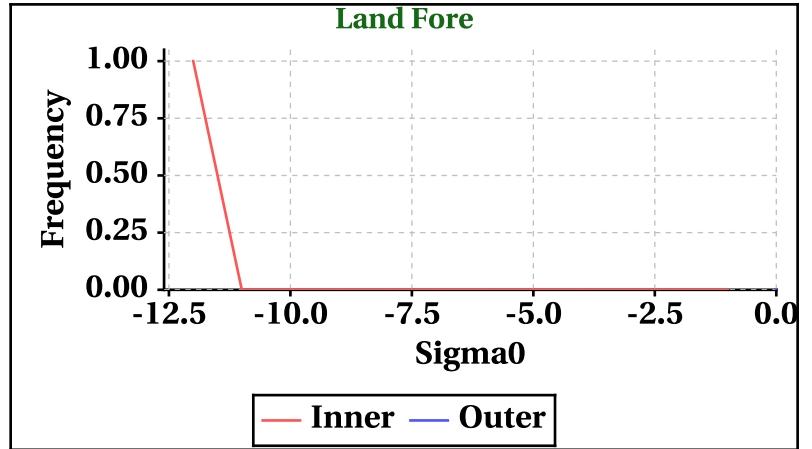
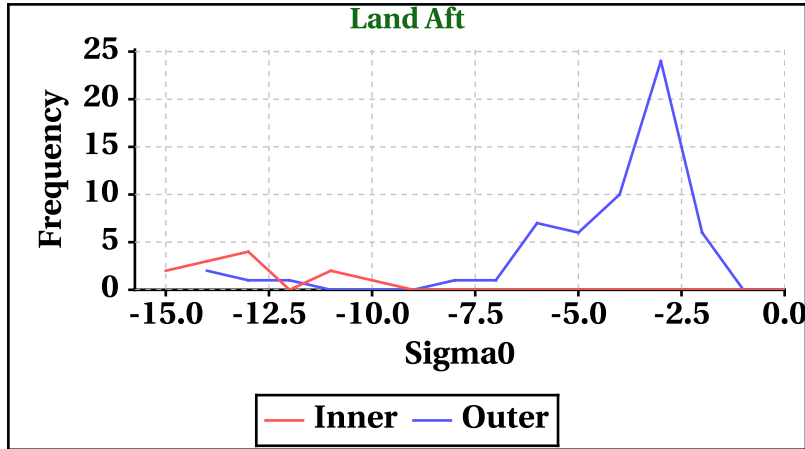


# Dynamic Range (Data Histograms)

## Sigma0(db)

| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -15      | -12       | -19     | -18      |
| Max             | 0        | 0         | 0       | 0        |

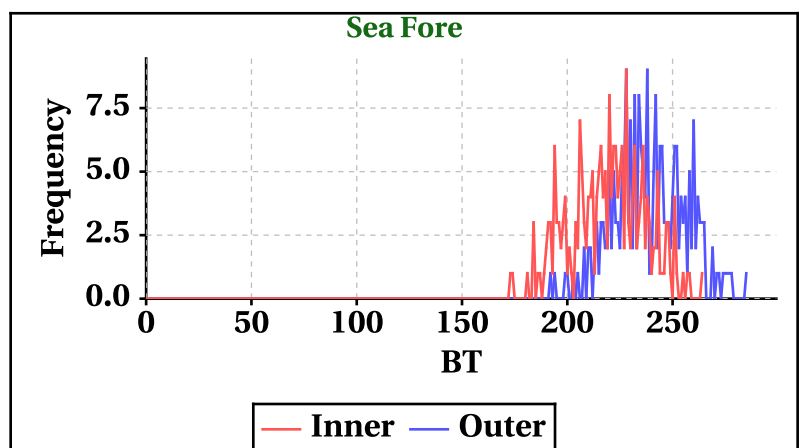
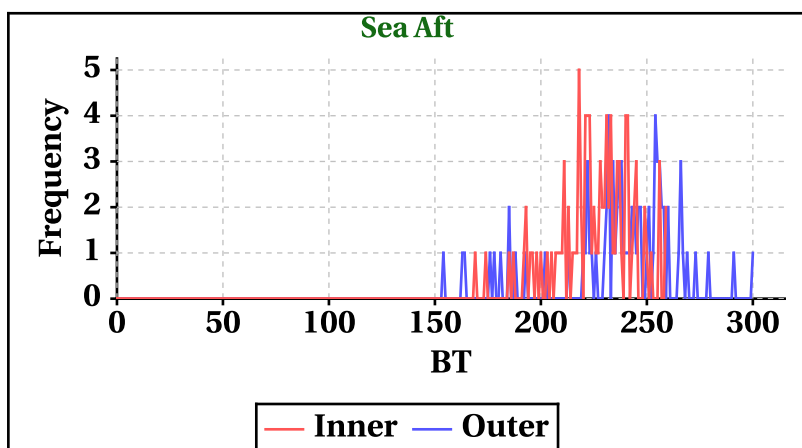
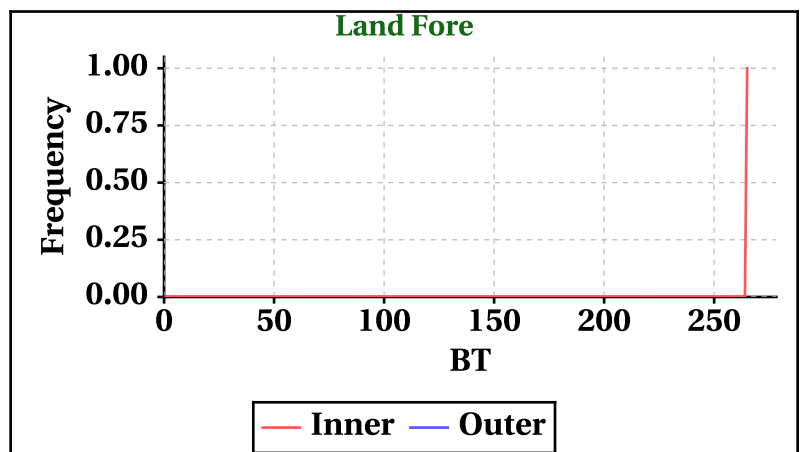
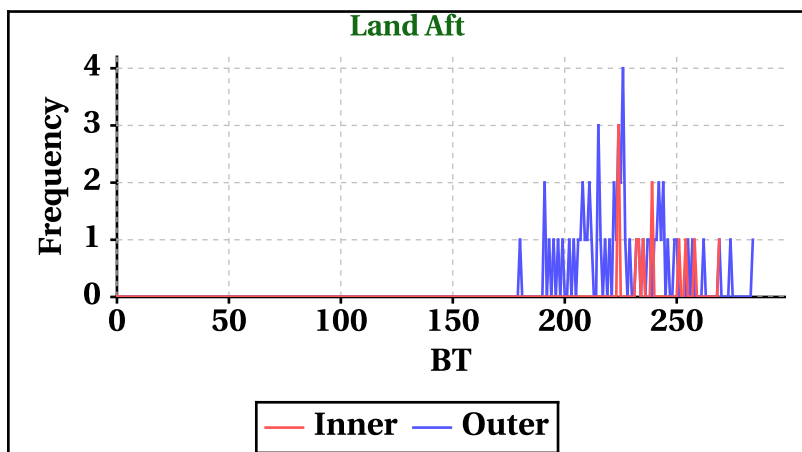
| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -14      | 0         | -22     | -22      |
| Max             | 0        | 0         | 0       | 0        |



## Brightness Temperature(K)

| Inner Beam(HH) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 269      | 265       | 259     | 264      |

| Outer Beam(VV) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 284      | 0         | 300     | 285      |

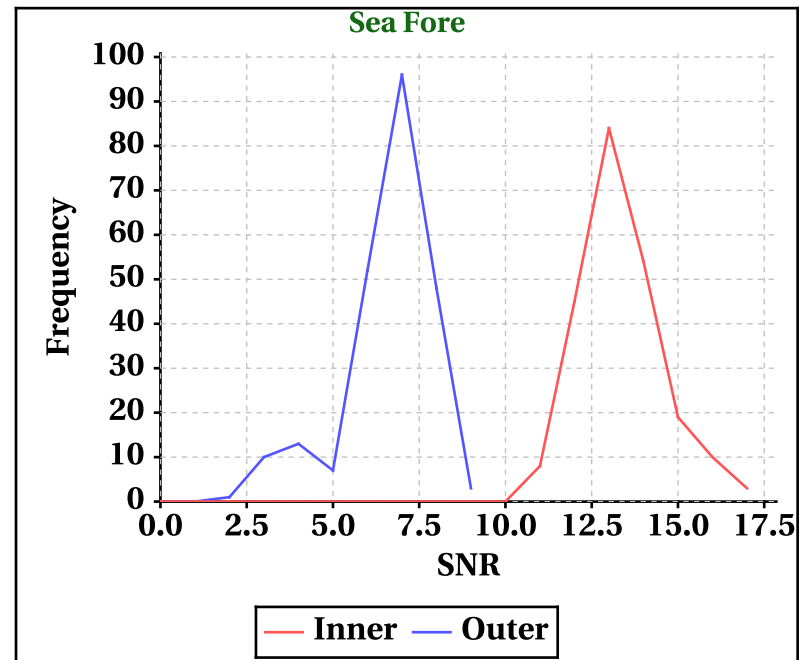
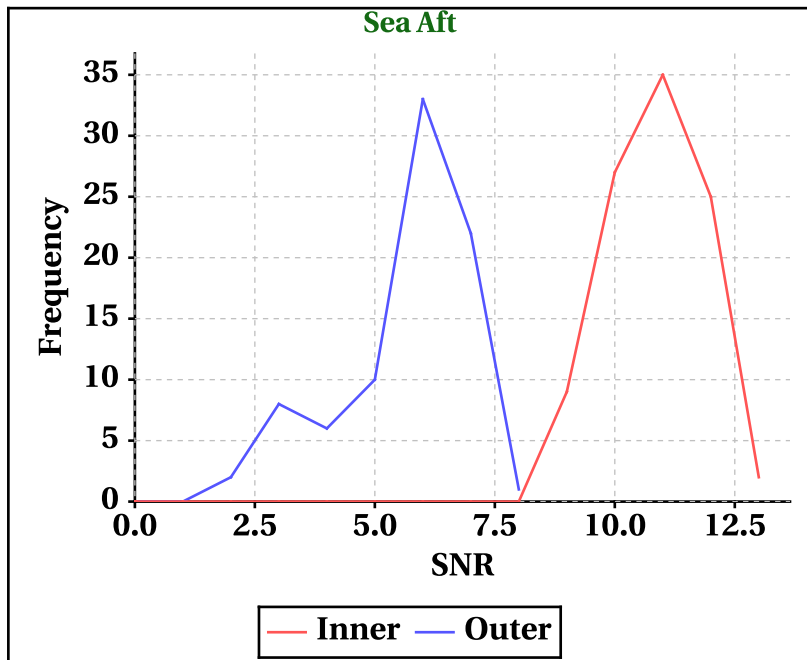
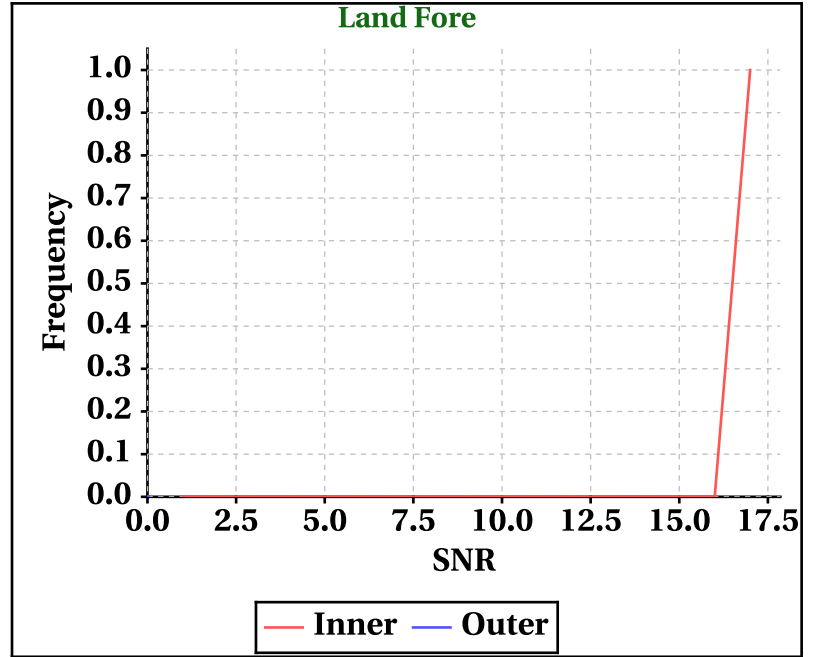
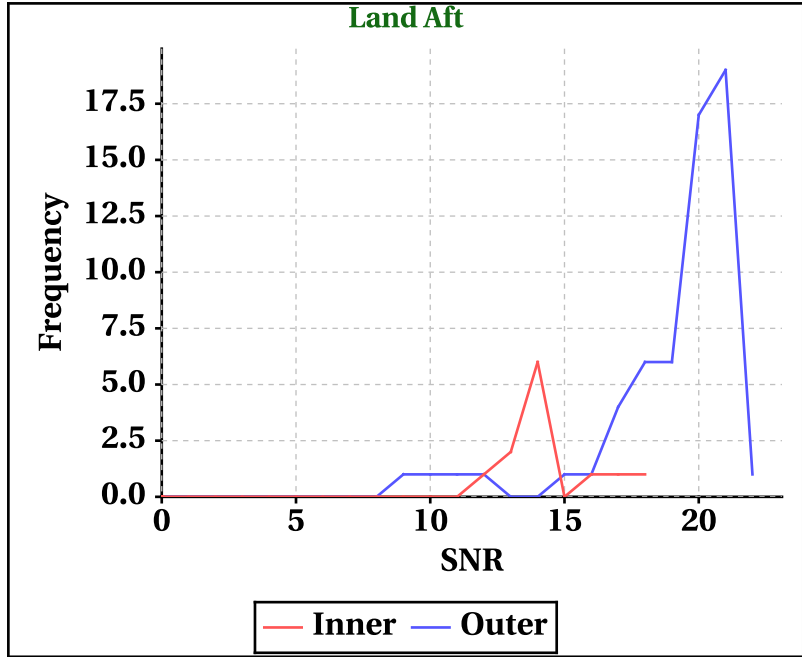


# Dynamic Range (Data Histograms)

## SNR(dBm)

| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | 0        | 0         | 0       | 0        |
| Max             | 18       | 17        | 13      | 17       |

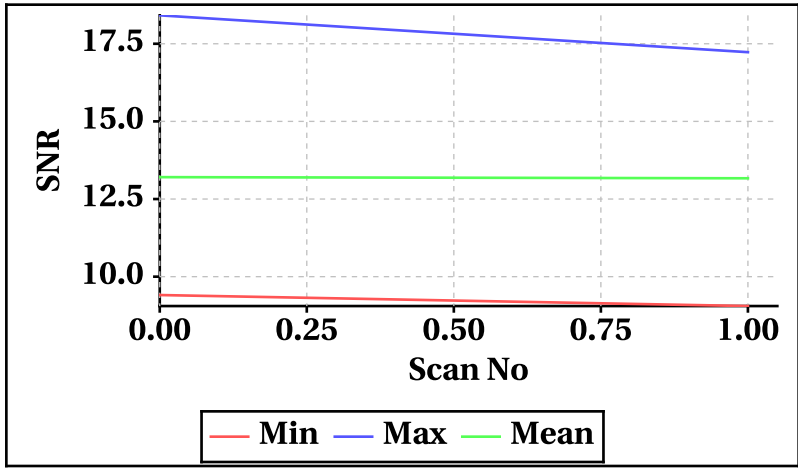
| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | 0        | 0         | 0       | 0        |
| Max             | 22       | 0         | 8       | 9        |



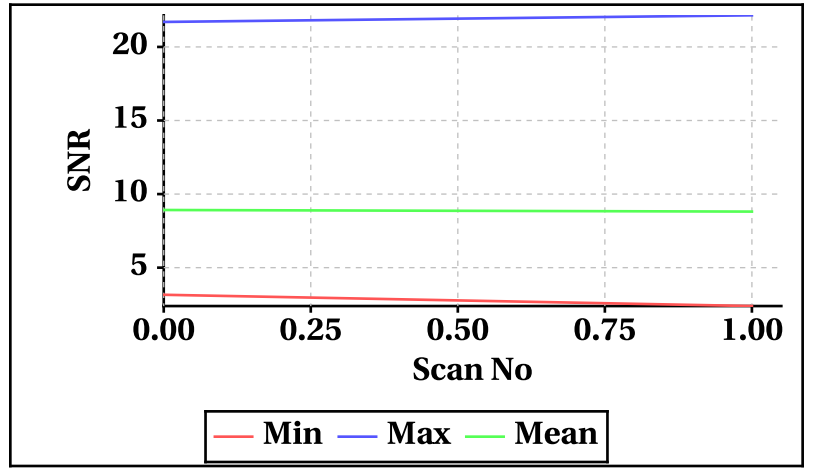


## Orbit-wise behaviour of SNR

**Inner Beam (HH)**

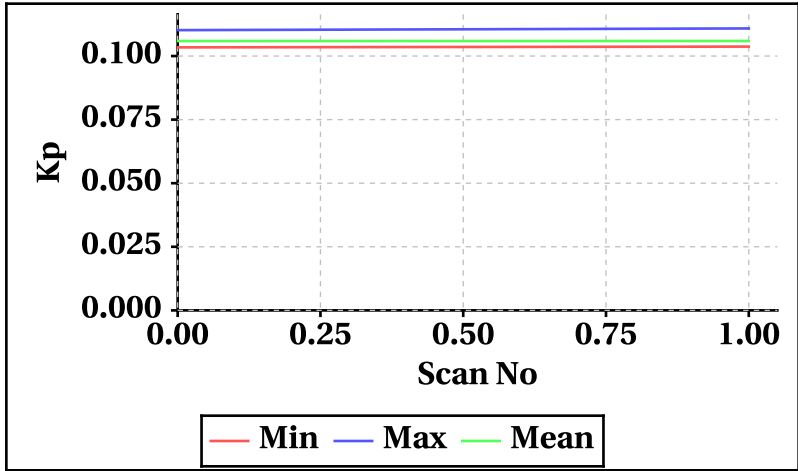


**Outer Beam(VV)**

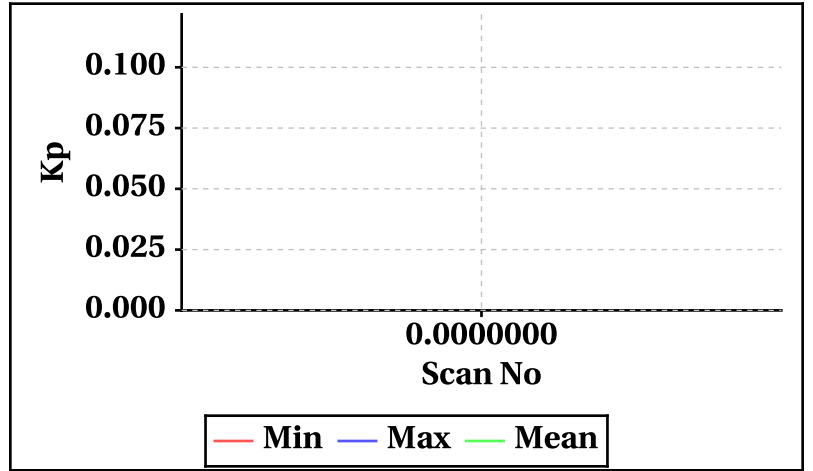


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

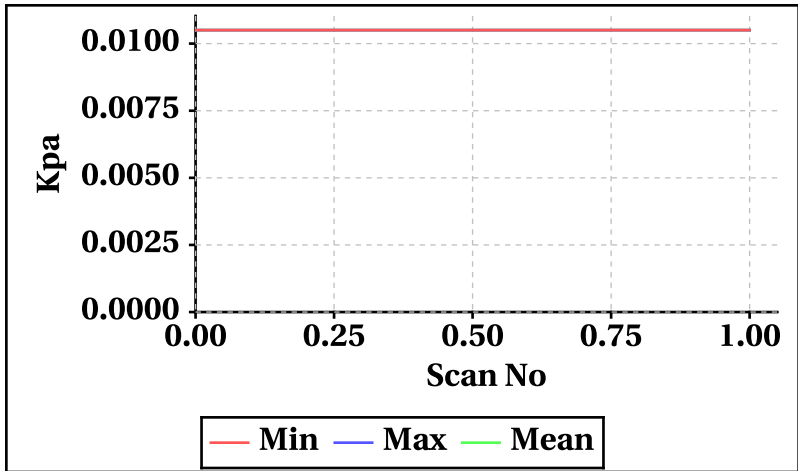
**Inner Beam(HH)**



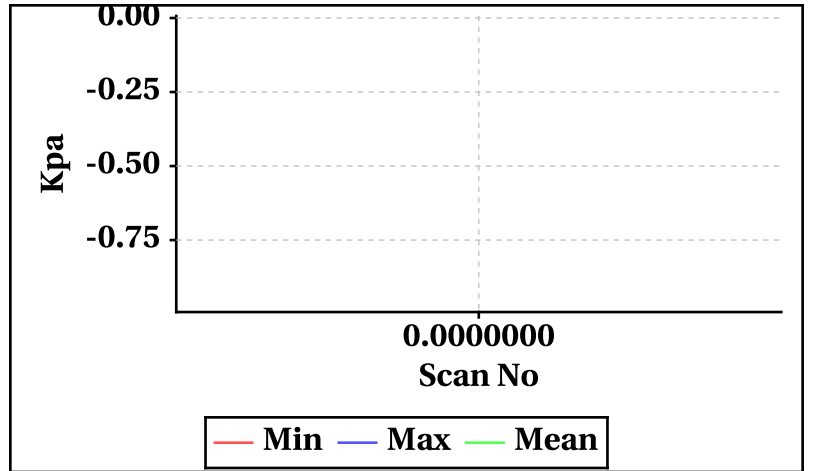
**Outer Beam(VV)**



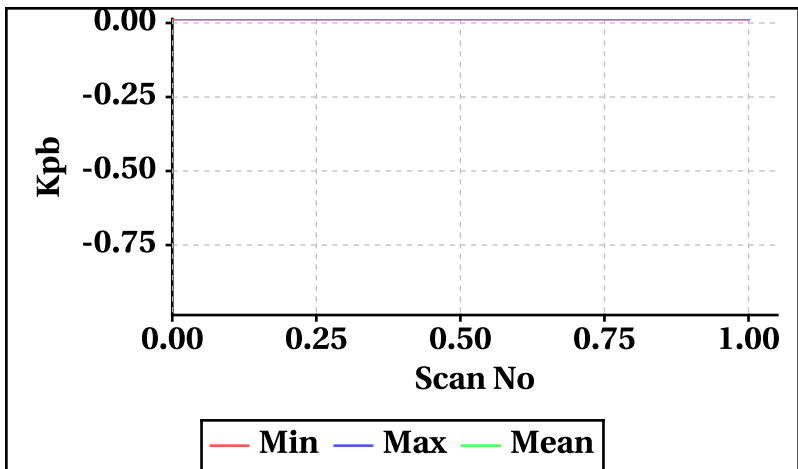
**Inner Beam(HH)**



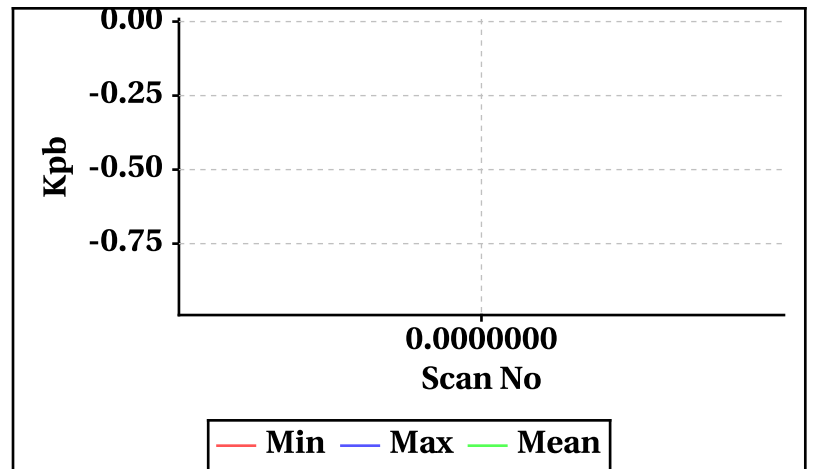
**Outer Beam(VV)**



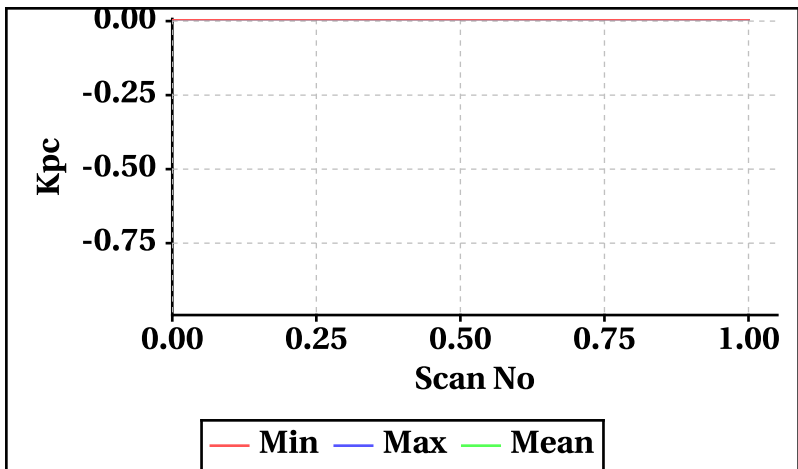
**Inner Beam(HH)**



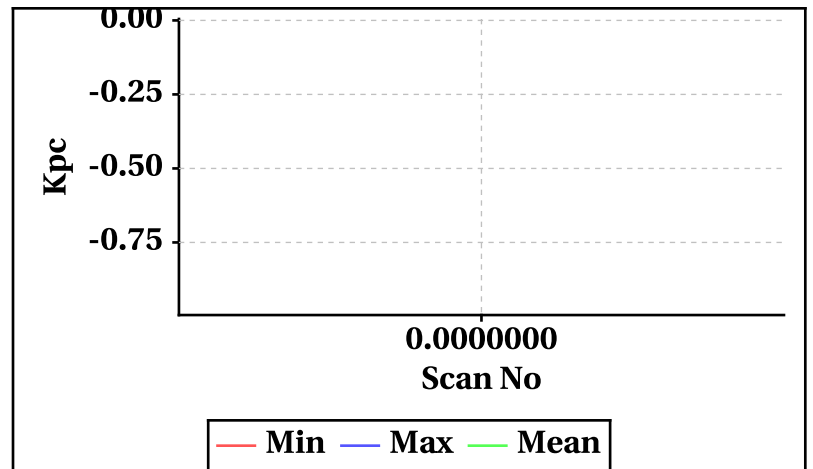
**Outer Beam(VV)**



**Inner Beam(HH)**

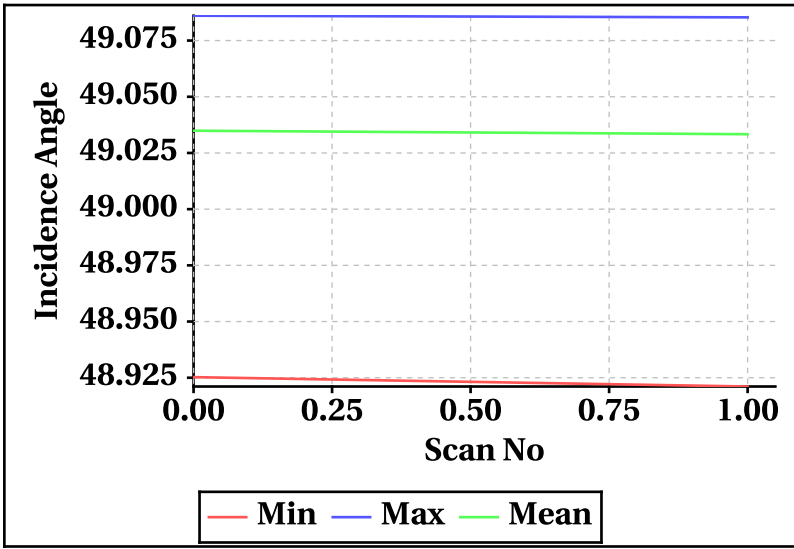


**Outer Beam(VV)**

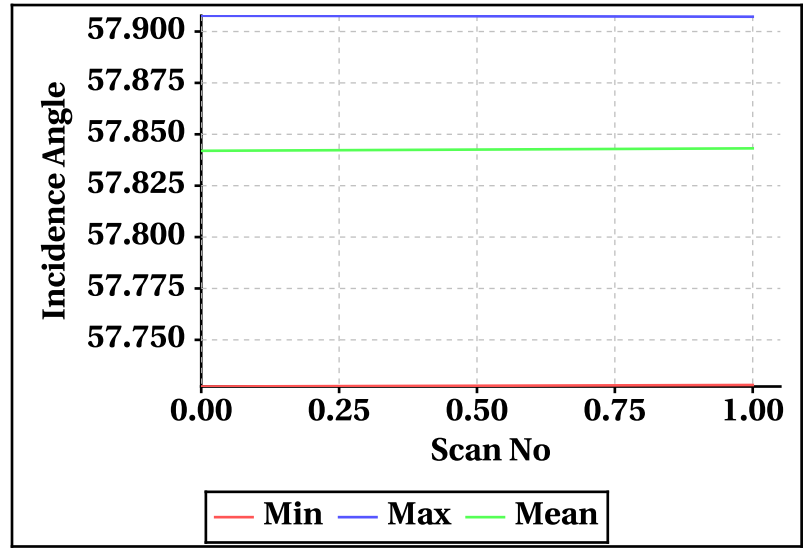


Orbt-wise behaviour of Incidence,Azimuth,Range,X-Factor

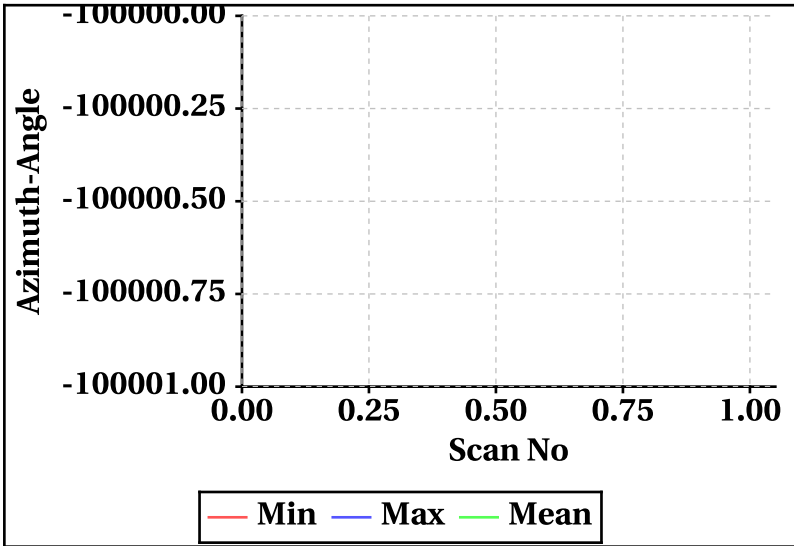
Inner Beam (HH)



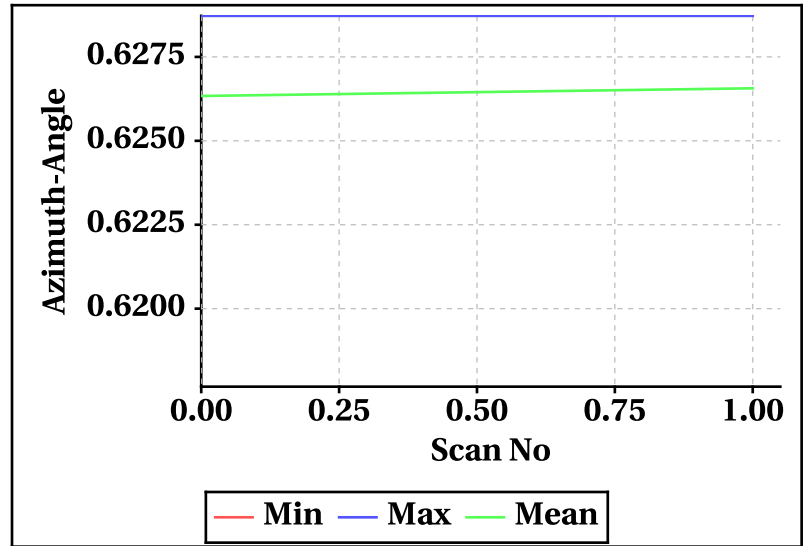
Outer Beam(VV)



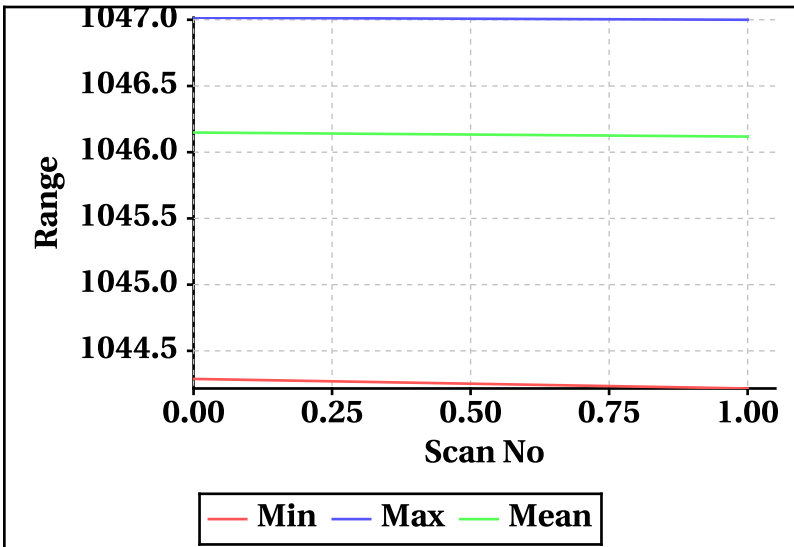
Inner Beam (HH)



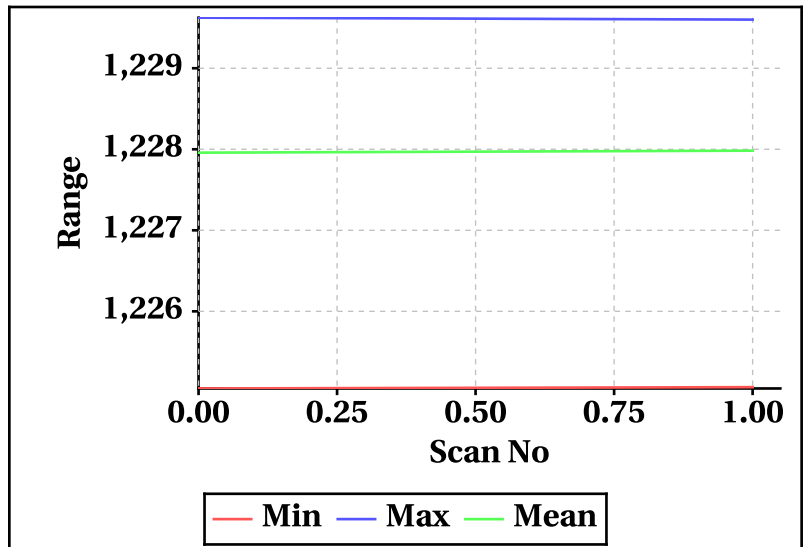
Outer Beam(VV)



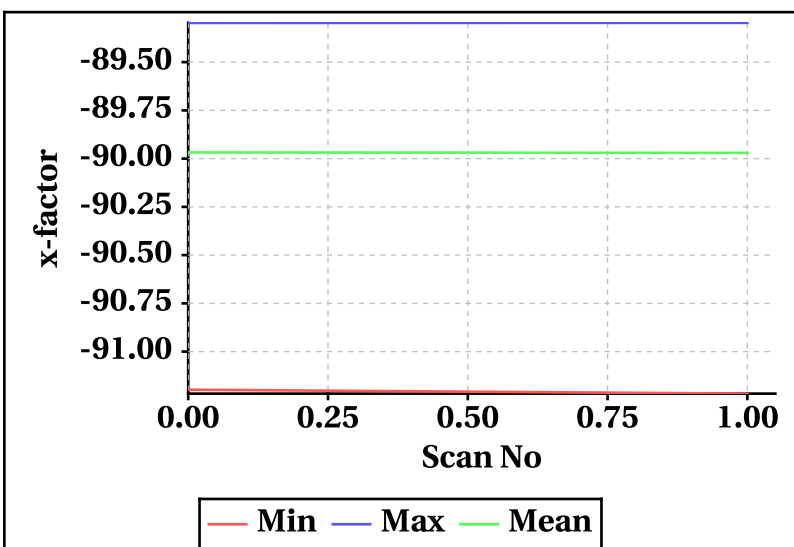
Inner Beam (HH)



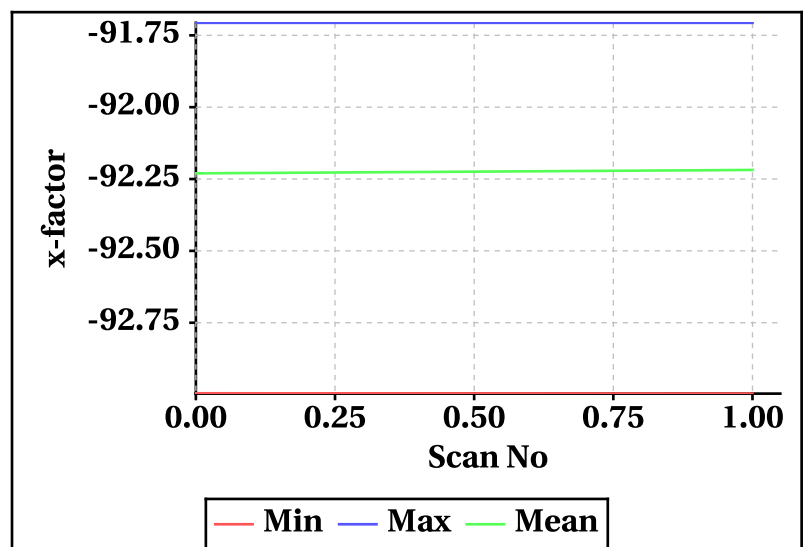
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



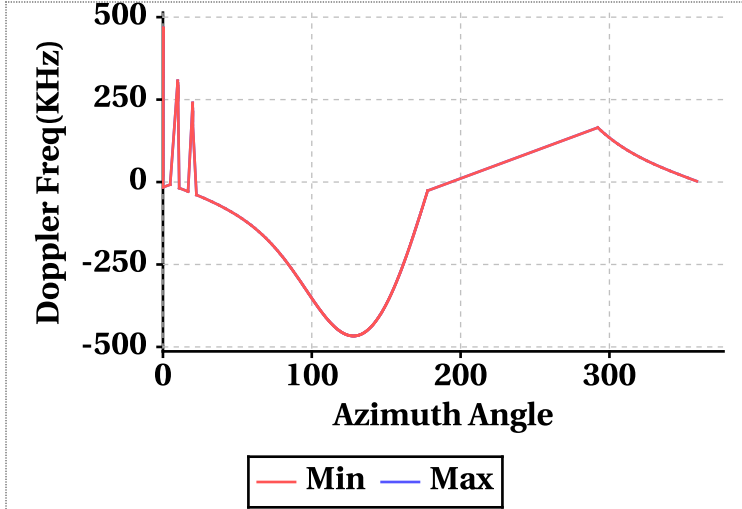


# Doppler Frequency Variation

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

|            | Inner Beam (HH) | Outer Beam (VV) |
|------------|-----------------|-----------------|
| <b>Min</b> | -466.80         | -523.14         |
| <b>Max</b> | 466.90          | 523.26          |

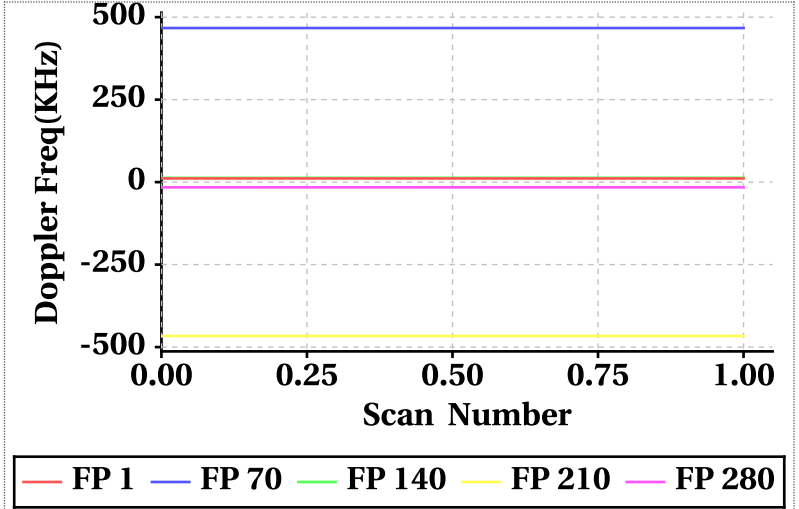
**Footprint wise Doppler frequency variation Inner Beam (HH)**



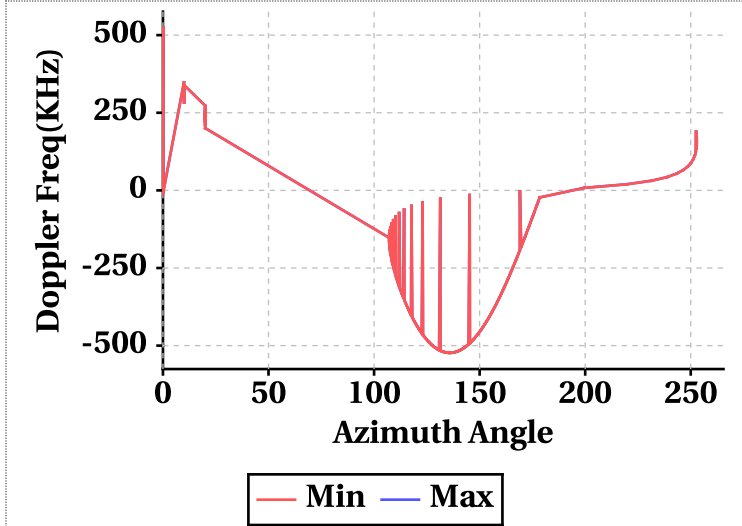
**Doppler Frequency(KHz) variation**

| Doppler_FP  | Inner Beam (HH) |         |         | Outer Beam (VV) |         |         |
|-------------|-----------------|---------|---------|-----------------|---------|---------|
|             | Min             | Max     | Mean    | Min             | Max     | Mean    |
| Doppler_1   | 11.00           | 11.18   | 11.09   | 7.18            | 7.40    | 7.29    |
| Doppler_70  | 466.88          | 466.88  | 466.88  | 523.12          | 523.12  | 523.12  |
| Doppler_140 | 12.86           | 13.02   | 12.94   | 7.90            | 8.06    | 7.98    |
| Doppler_210 | -466.38         | -466.38 | -466.38 | -522.92         | -522.92 | -522.92 |
| Doppler_280 | -15.82          | -15.76  | -15.79  | -11.24          | -11.18  | -11.21  |

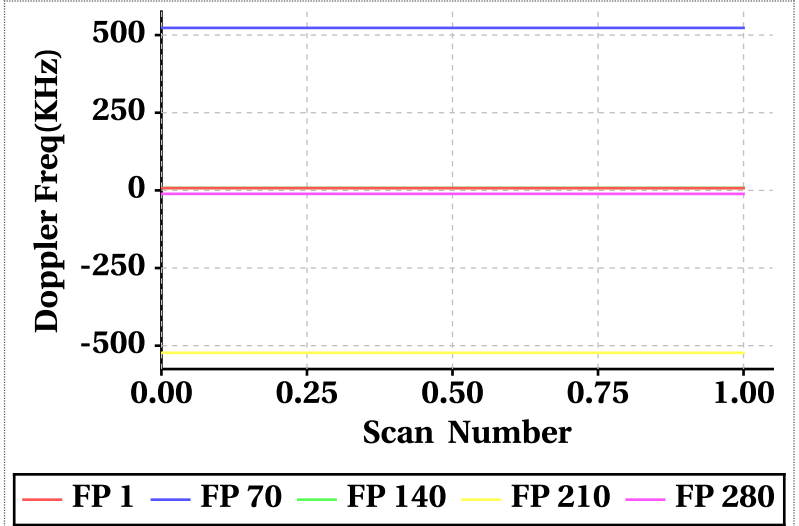
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

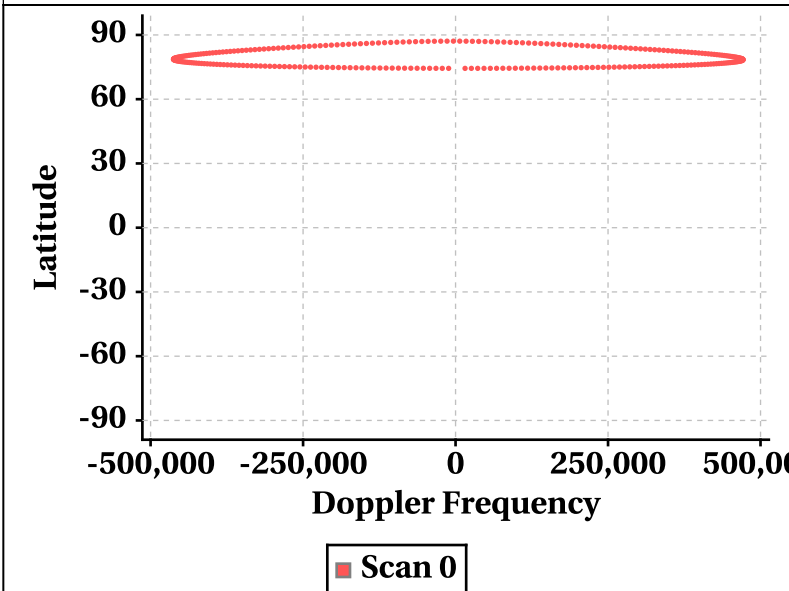


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

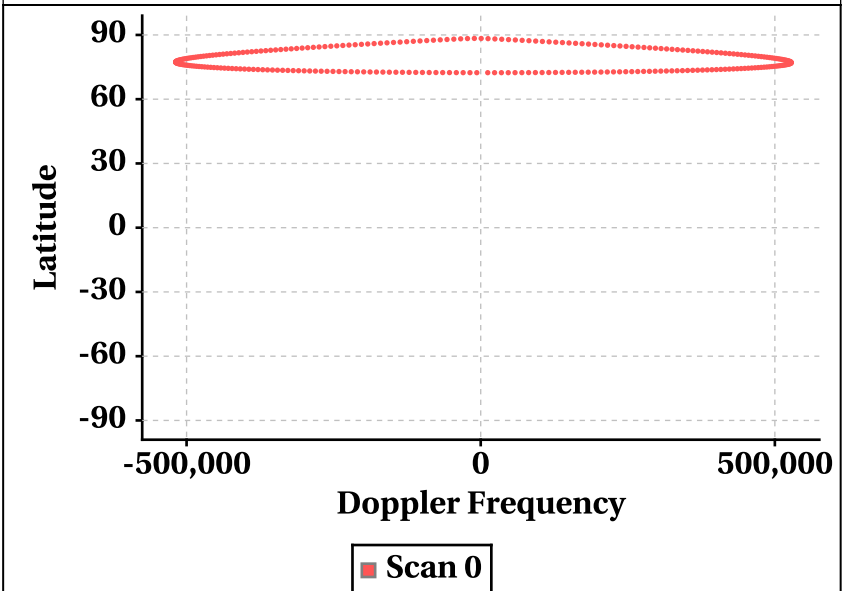


# Latitude Vs Doppler Frequency

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



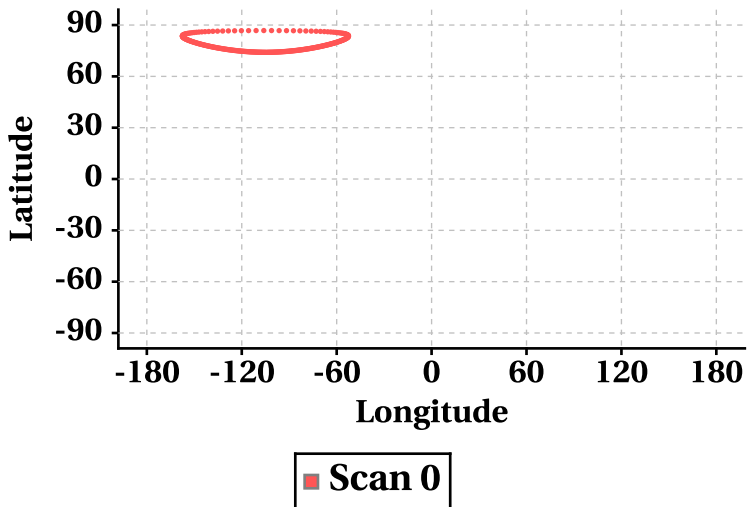
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



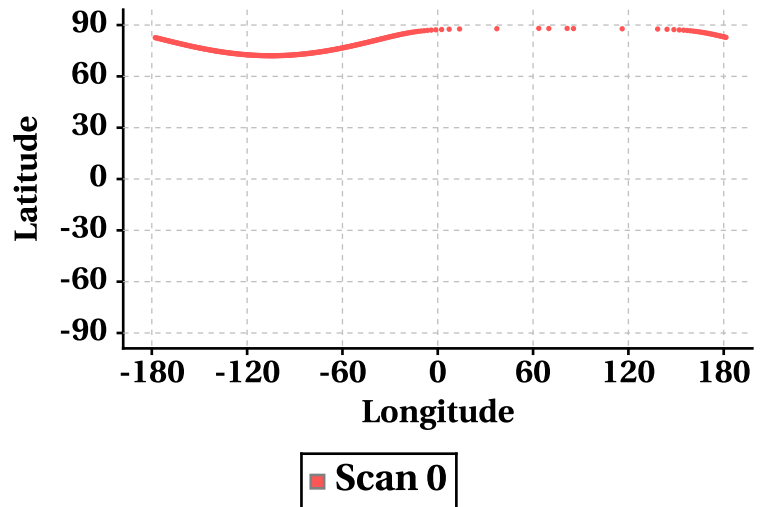
# Parameter as a function of Latitude

## Latitude Vs Longitude

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

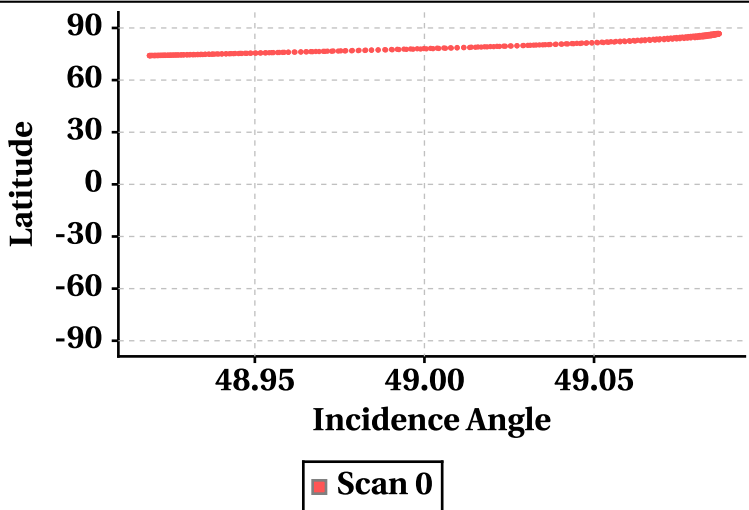


### Scan Trace [Outer Beam (VV)]

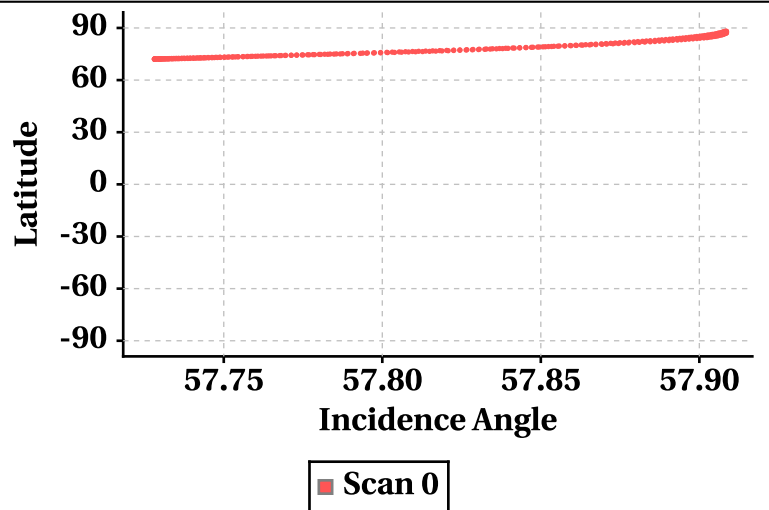


## Latitude Vs Incidence Angle

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

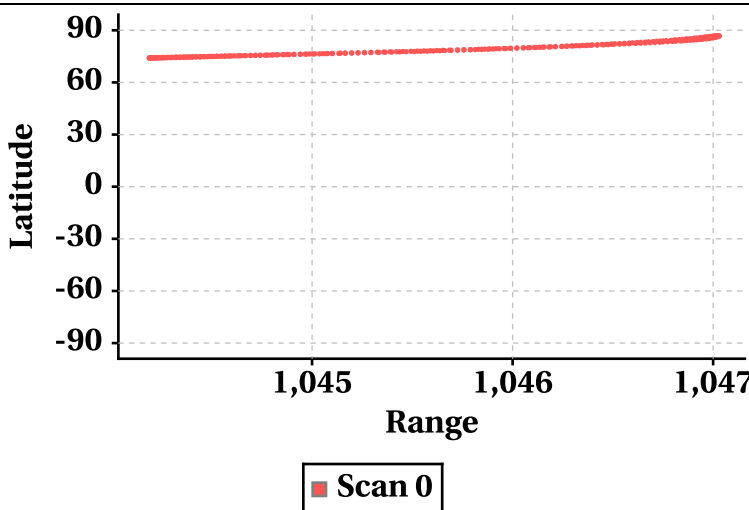


### Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

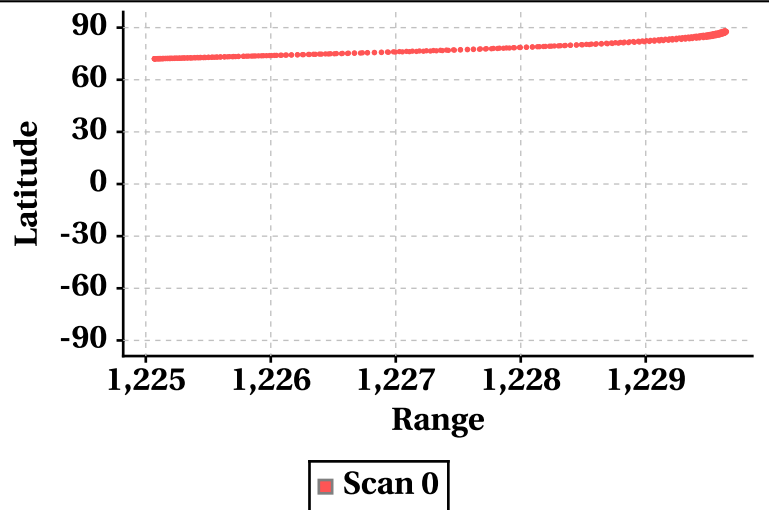


## Latitude Vs Range

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



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



# Variation in Orbit and Attitude Parameters

