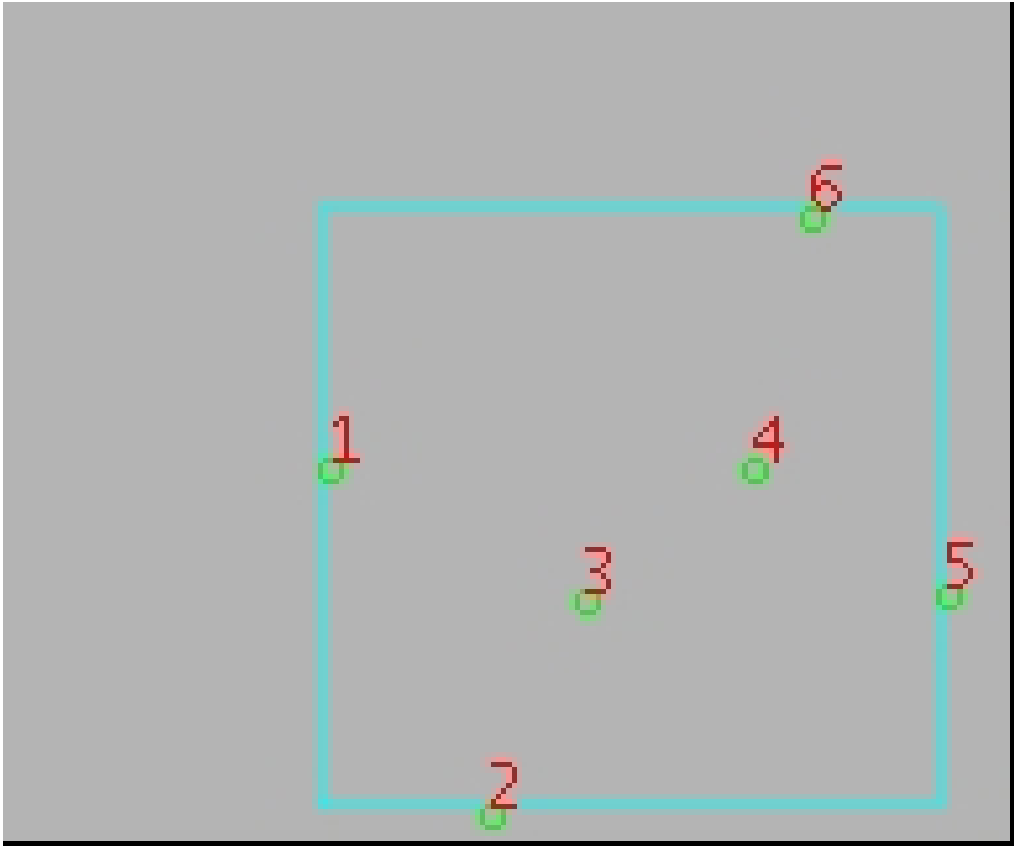


DQE Report: GDQE - Location parameters for INSAT-3D-SND STANDARD Product 3DSND\_18FEB2017\_0300

|               |                |                 |               |                 |          |
|---------------|----------------|-----------------|---------------|-----------------|----------|
| Satellite     | INSAT-3D       | No Of Bands     | 19            | Product Type    | STANDARD |
| Sensor        | SND            | LvlOfProcess    | L1B           | Selected Band   | 2-LWIR3  |
| DOP/Time      | 18-02-17/03:00 | Station ID      | BES           | Field View(deg) | 6.136    |
| Res(Y,X) [Km] | (10.0,10.0)    | Res(Y,X) [uRad] | (280.0,280.0) |                 |          |

(41.455N,50.793W)

(41.455N,101.264E)



(6.875S,50.793W)

(6.875S,101.264E)

GCP Distribution overview for 3DSND18FEB20170300L1BSA1

Image Width: 384 Image Height: 320 No Of GCPs: 6

GCP Coverage(%) 71.41 (N-S) 61.78 (E-W)

Location Error(E)

Legend —0Km < E <= 50Km —50Km < E <= 100Km —E >100Km

Location Error (Km)

|        | Mean   | Direction | Stddev | RMS    |
|--------|--------|-----------|--------|--------|
| Along  | 13.133 | N         | 7.416  | 15.082 |
| Across | 7.255  | E         | 20.880 | 22.104 |

Scale (Km)

|         | Pixel Size | Stddev | %variation |
|---------|------------|--------|------------|
| Average | 10.868     | 0.700  | 8.685      |
| Along   | 11.108     | 1.361  | 11.078     |
| Across  | 11.038     | 2.780  | 10.383     |

Internal Distortion (in Pixels)

|        | PeakToPeak | Mean   | Stddev | RMS   |
|--------|------------|--------|--------|-------|
| Along  | 1.907      | 0.846  | 0.67   | 1.079 |
| Across | 3.820      | -2.955 | 1.35   | 3.247 |

Attitude Residuals (Deg)

| Pitch    | Roll     | Yaw      |
|----------|----------|----------|
| -0.01597 | -0.02864 | -0.36431 |

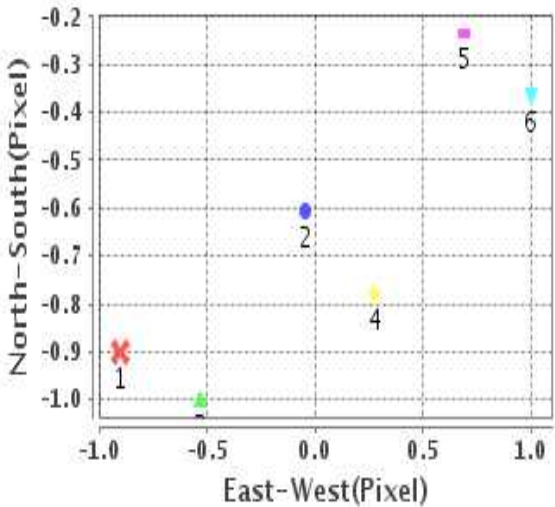
Reference Used

| Sensor | Resolution | Projection |
|--------|------------|------------|
| ETM    | 500.00     | GGP        |

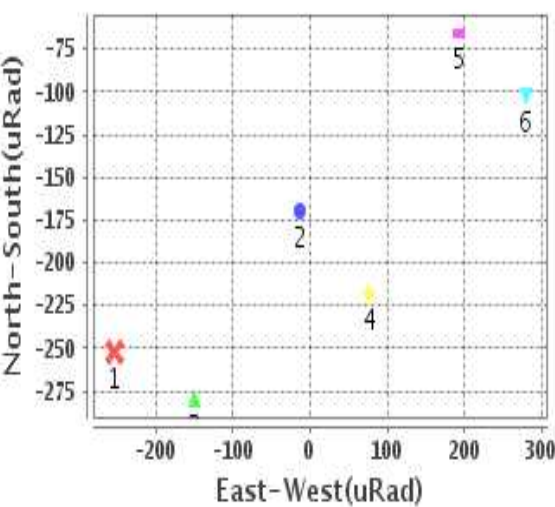
Radial Error (Km)

|      |        |
|------|--------|
| Mean | 25.597 |
| Min  | 12.200 |
| Max  | 38.466 |
| CE90 | 29.487 |

Location Error For GCPs(Pixel)



Location Error For GCPs(uRad)



Detailed Product Information

Ancillary Info

|                   |               |                           |            |
|-------------------|---------------|---------------------------|------------|
| Satellite         | INSAT-3D      | Generation Date           | 18-02-17   |
| Sensor            | SND           | DQE Date                  | 21-02-2017 |
| PassType          | NONE          | Aquisition Date           | 18-02-17   |
| Imaging Mode      | FULL_FRAME    | Aquisition Time(GMT)      | 03:00      |
| Sat Altitude(m)   | 3.6E7         | Nominal Altitude(Km)      | 3.6E7      |
| Station           | BES           | Predicted Altitude(Km)    | -1000.0    |
| Sat Location(deg) | 0.0 E         | Nominal Center Lat(deg)   | 0.0        |
| Format            | hdf5-1.8.8    | Nominal Center Lon(deg)   | 82.0       |
| LvlOfProcessing   | STANDARD      | Predicted Center Lat(deg) | 0.0        |
| DP JobId          | 3DSND_18FEB20 | Predicted Center Lon(deg) | 0.0        |
| ProductCode       | NONE          |                           |            |
| Field View(deg)   | 6.136         |                           |            |

Projection Parameters

|                               |          |
|-------------------------------|----------|
| Projection                    | None     |
| Ellipsoid                     | WGS_84   |
| Datum                         | WGS_84   |
| Zone                          | NotAvail |
| Semi_Major_Axis(Km)           | 6378.14  |
| Semi_Minor_Axis(Km)           | 6356.75  |
| Standard_Parallel1(deg)       | -999.99  |
| Standard_Parallel2(deg)       | -999.99  |
| Projection-Origin_Lon(deg)    | -999.99  |
| Projection-Origin_Lat(deg)    | -999.99  |
| Projection_False_Easting(Km)  | -999.99  |
| Projection_False_Northing(Km) | -999.99  |

Scene Center Desc

|                   |         |
|-------------------|---------|
| Centre Lat(deg)   | 24.165  |
| Center Lon(deg)   | 76.029  |
| Centre Roll(deg)  | -999.0  |
| Centre Pitch(deg) | -999.0  |
| Center Yaw(deg)   | -999.0  |
| SunElevation(deg) | -999.99 |
| SunAzimuth(deg)   | -999.99 |
| SatElevation(deg) | -999.99 |
| SatAzimuth(deg)   | -999.99 |

Scene Corner Desc

|             |         |
|-------------|---------|
| NW_Lat(deg) | 41.455  |
| NW_Lon(deg) | 50.793  |
| SW_Lat(deg) | 6.875   |
| SW_Lon(deg) | 50.793  |
| NE_Lat(deg) | 41.455  |
| NE_Lon(deg) | 101.264 |
| SE_Lat(deg) | 6.875   |
| SE_Lon(deg) | 101.264 |

Band Wise Details

|       | Res_AL(Km) | Res_AX(Km) | Image Height | Image Width |
|-------|------------|------------|--------------|-------------|
| LWIR1 | 10.0       | 10.0       | 320          | 384         |
| LWIR2 | 10.0       | 10.0       | 320          | 384         |
| LWIR3 | 10.0       | 10.0       | 320          | 384         |
| LWIR4 | 10.0       | 10.0       | 320          | 384         |
| LWIR5 | 10.0       | 10.0       | 320          | 384         |
| LWIR6 | 10.0       | 10.0       | 320          | 384         |

GDQE Computation Base

|            |                |                               |        |                        |            |                     |           |
|------------|----------------|-------------------------------|--------|------------------------|------------|---------------------|-----------|
| Projection | MER            | Wildpoint Rejection Threshold | 2.60   | SemiMajorAxis(m)       | 6378137.00 | Mode Of Computation | grid      |
| Ellipsoid  | WGS_84         |                               | -sigma | SemiMinorAxis(m)       | 6356752.31 | Used Reference Type | REFINSREF |
| Datum      | WGS_84         | Unit                          | pixels | Standardparallel1(deg) | 17.0       |                     |           |
| Zone       | Not Applicable |                               |        | Standardparallel2(deg) | 17.0       |                     |           |

\* -999.99 : Not Applicable/Not Available

## References

**JobId : 3DSND18FEB20170300L1BSA1**

(-999.99 - Not Available/Not Computed)

| Ref.No | Source | File Name       | Resolution ( m ) | Projection |
|--------|--------|-----------------|------------------|------------|
| 1      | ETM    | world_Band1.img | 500.0            | GGP        |

## Location Accuracy

### GCP Distribution Statistics

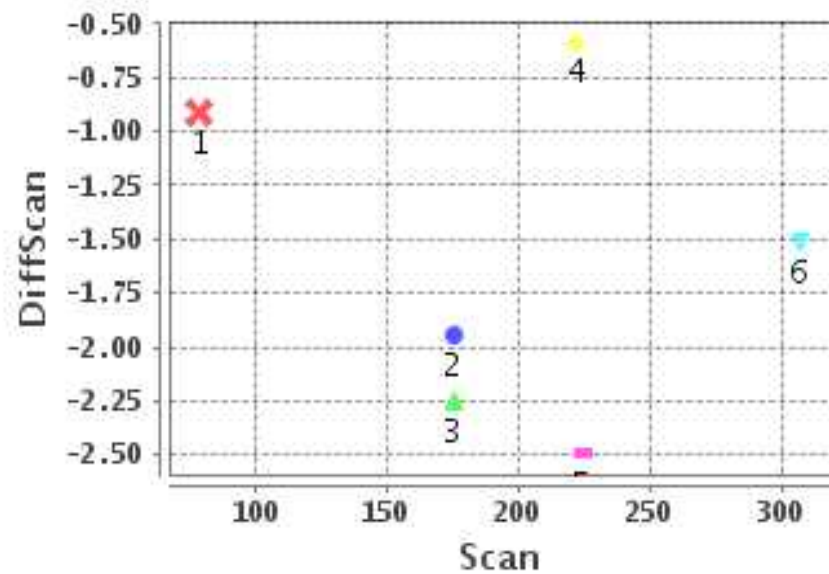
Image Width (pixels) : 384      Image Height (pixels) : 320      No of GCPs : 6

|          | Mean  | StdDev | Min   | Max    | Coverage(in %) |
|----------|-------|--------|-------|--------|----------------|
| GCP Scan | 197.2 | 68.9   | 78.8  | 307.25 | 71.41 (N-S)    |
| GCP Pix  | 244.6 | 79.5   | 120.2 | 357.50 | 61.78 (E-W)    |

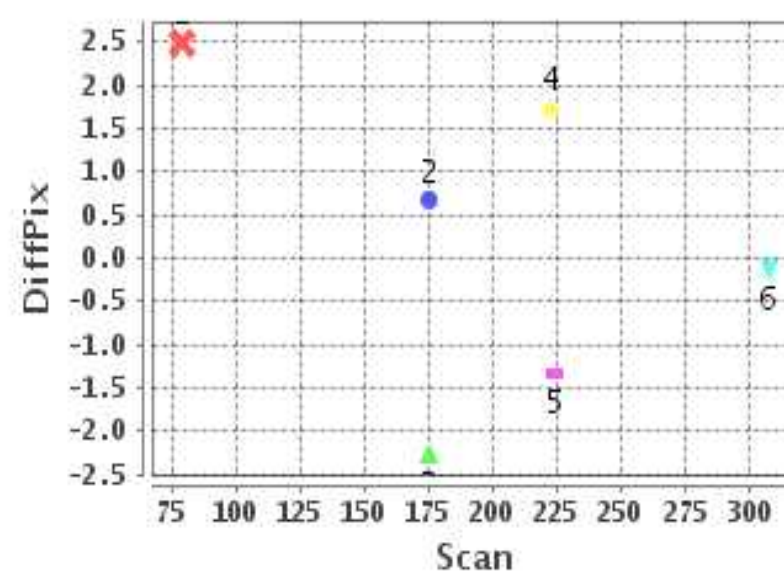
### Identified Control Point details : ( Differences are Reference - Product )

| No | Scan  | Pix   | DiffScan (line) | DiffPix (pixel) | DifLat (Km) | Dir | DifLon (Km) | Dir | Status   |
|----|-------|-------|-----------------|-----------------|-------------|-----|-------------|-----|----------|
| 1  | 175.5 | 120.2 | -2.3            | -2.26           | 19.808      | N   | 21.843      | W   | Accepted |
| 2  | 307.2 | 182.0 | -1.5            | -0.12           | 12.148      | N   | 1.126       | W   | Accepted |
| 3  | 224.5 | 219.2 | -2.5            | -1.33           | 21.389      | N   | 12.217      | W   | Accepted |
| 4  | 175.2 | 282.8 | -1.9            | 0.68            | 18.532      | N   | 17.073      | E   | Accepted |
| 5  | 222.2 | 357.5 | -0.6            | 1.73            | 3.660       | N   | 23.314      | E   | Accepted |
| 6  | 78.8  | 305.8 | -0.9            | 2.49            | 3.262       | N   | 38.327      | E   | Accepted |

Error(Pixels) Vs. GCPScan



Error(Pixels) Vs. GCPScan



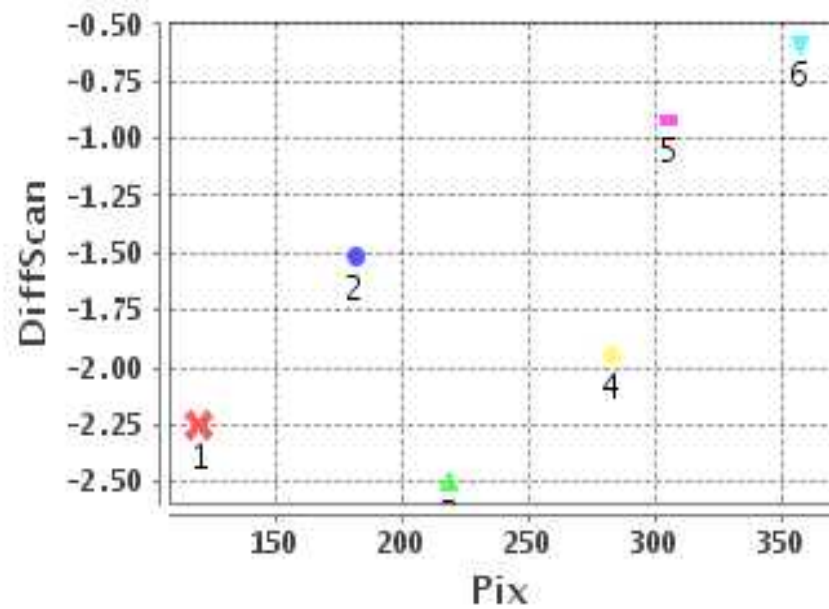
Number Of Points

|       |   |
|-------|---|
| North | 6 |
| South | 0 |
| East  | 3 |
| West  | 3 |

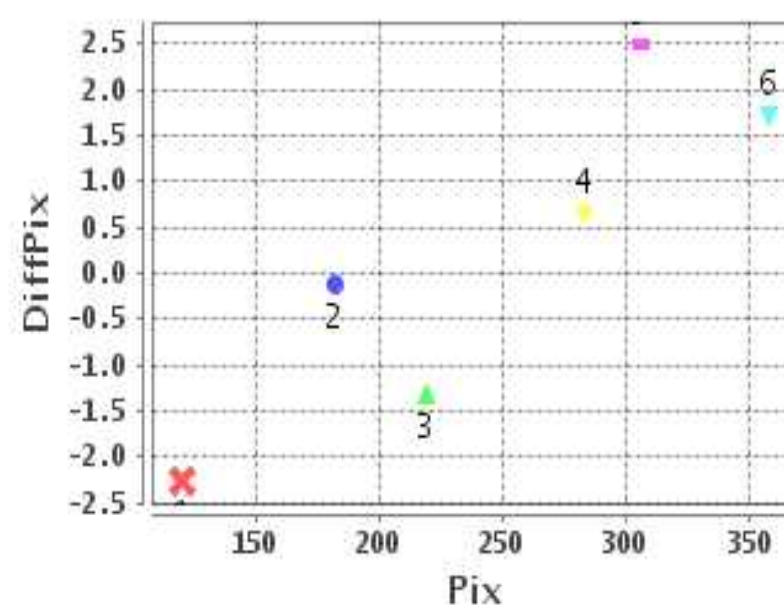
Radial Error ( Km)

|      |        |
|------|--------|
| Mean | 25.597 |
| Min  | 12.200 |
| Max  | 38.466 |
| CE90 | 29.487 |

Error(Pixels) Vs. GCPPix



Error(Pixels) Vs. GCPPix



Location Accuracy

|               | Mean   | StdDev | RMS    | Dir | * MinRMS | * MaxRMS |
|---------------|--------|--------|--------|-----|----------|----------|
| Along( Km )   | 13.133 | 7.416  | 15.082 | N   | 13.471   | 16.457   |
| Across ( Km ) | 7.255  | 20.880 | 22.104 | E   | 17.104   | 24.209   |

Block-Wise Geo location Error Statistics

Location Accuracy,Scale,ID

| Scan Range-0-105; Pix Range-0-127 |         |          |
|-----------------------------------|---------|----------|
| Number of GCPs                    | -999    |          |
| Location Error(Km)                |         |          |
| Along(Mean,Dir)                   | -999.99 | NotAvail |
| Across(Mean,Dir)                  | -999.99 | NotAvail |
| Scale(Km)                         |         |          |
| Average Scale (Mean,%Variation)   | -999.99 | -999.9   |
| Internal Distortion(Pixel)        |         |          |
| Along(Mean,Stddev)                | -999.99 | -999.99  |
| Across(Mean,Stddev)               | -999.99 | -999.99  |

|                                     |         |          |
|-------------------------------------|---------|----------|
| Scan Range-0-105; Pix Range-127-255 |         |          |
| Number of GCPs                      | -999    |          |
| Location Error(Km)                  |         |          |
| Along(Mean,Dir)                     | -999.99 | NotAvail |
| Across(Mean,Dir)                    | -999.99 | NotAvail |
| Scale(Km)                           |         |          |
| Average Scale (Mean,%Variation)     | -999.99 | -999.9   |
| Internal Distortion(Pixel)          |         |          |
| Along(Mean,Stddev)                  | -999.99 | -999.99  |
| Across(Mean,Stddev)                 | -999.99 | -999.99  |

|                                     |         |         |
|-------------------------------------|---------|---------|
| Scan Range-0-105; Pix Range-255-384 |         |         |
| Number of GCPs                      | 1       |         |
| Location Error(Km)                  |         |         |
| Along(Mean,Dir)                     | 3.27    | N       |
| Across(Mean,Dir)                    | 38.33   | E       |
| Scale(Km)                           |         |         |
| Average Scale (Mean,%Variation)     | -999.99 | -999.9  |
| Internal Distortion(Pixel)          |         |         |
| Along(Mean,Stddev)                  | -999.99 | -999.99 |
| Across(Mean,Stddev)                 | -999.99 | -999.99 |

| Scan Range-105-212; Pix Range-0-127 |         |         |  |
|-------------------------------------|---------|---------|--|
| Number of GCPs                      | 1       |         |  |
| Location Error(Km)                  |         |         |  |
| Along(Mean,Dir)                     | 19.8    | N       |  |
| Across(Mean,Dir)                    | -21.84  | W       |  |
| Scale(Km)                           |         |         |  |
| Average Scale (Mean,%Variation)     | -999.99 | -999.9  |  |
| Internal Distortion(Pixel)          |         |         |  |
| Along(Mean,Stddev)                  | -999.99 | -999.99 |  |
| Across(Mean,Stddev)                 | -999.99 | -999.99 |  |

| Scan Range-105-212; Pix Range-127-255 |         |          |
|---------------------------------------|---------|----------|
| Number of GCPs                        | -999    |          |
| Location Error(Km)                    |         |          |
| Along(Mean,Dir)                       | -999.99 | NotAvail |
| Across(Mean,Dir)                      | -999.99 | NotAvail |
| Scale(Km)                             |         |          |
| Average Scale (Mean,%Variation)       | -999.99 | -999.9   |
| Internal Distortion(Pixel)            |         |          |
| Along(Mean,Stddev)                    | -999.99 | -999.99  |
| Across(Mean,Stddev)                   | -999.99 | -999.99  |

|                                       |         |         |
|---------------------------------------|---------|---------|
| Scan Range-105-212; Pix Range-255-384 |         |         |
| Number of GCPs                        | 1       |         |
| Location Error(Km)                    |         |         |
| Along(Mean,Dir)                       | 18.53   | N       |
| Across(Mean,Dir)                      | 17.07   | E       |
| Scale(Km)                             |         |         |
| Average Scale (Mean,%Variation)       | -999.99 | -999.9  |
| Internal Distortion(Pixel)            |         |         |
| Along(Mean,Stddev)                    | -999.99 | -999.99 |
| Across(Mean,Stddev)                   | -999.99 | -999.99 |

|                                     |         |          |
|-------------------------------------|---------|----------|
| Scan Range-212-320; Pix Range-0-127 |         |          |
| Number of GCPs                      | -999    |          |
| Location Error(Km)                  |         |          |
| Along(Mean,Dir)                     | -999.99 | NotAvail |
| Across(Mean,Dir)                    | -999.99 | NotAvail |
| Scale(Km)                           |         |          |
| Average Scale (Mean,%Variation)     | -999.99 | -999.9   |
| Internal Distortion(Pixel)          |         |          |
| Along(Mean,Stddev)                  | -999.99 | -999.99  |
| Across(Mean,Stddev)                 | -999.99 | -999.99  |

|                                       |        |      |
|---------------------------------------|--------|------|
| Scan Range-212-320; Pix Range-105-255 |        |      |
| Number of GCPs                        | 2      |      |
| Location Error(Km)                    |        |      |
| Along(Mean,Dir)                       | 16.769 | N    |
| Across(Mean,Dir)                      | -6.67  | W    |
| Scale(Km)                             |        |      |
| Average Scale (Mean,%Variation)       | 10.05  | 0.53 |
| Internal Distortion(Pixel)            |        |      |
| Along(Mean,Stddev)                    | -0.98  | 0.00 |
| Across(Mean,Stddev)                   | 1.21   | 0.00 |

|                                       |         |         |
|---------------------------------------|---------|---------|
| Scan Range-212-320; Pix Range-255-384 |         |         |
| Number of GCPs                        | 1       |         |
| Location Error(Km)                    |         |         |
| Along(Mean,Dir)                       | 3.66    | N       |
| Across(Mean,Dir)                      | 23.31   | E       |
| Scale(Km)                             |         |         |
| Average Scale (Mean,%Variation)       | -999.99 | -999.9  |
| Internal Distortion(Pixel)            |         |         |
| Along(Mean,Stddev)                    | -999.99 | -999.99 |
| Across(Mean,Stddev)                   | -999.99 | -999.99 |

\*-999 : no gcp available  
\* -999.99 : values are not computed