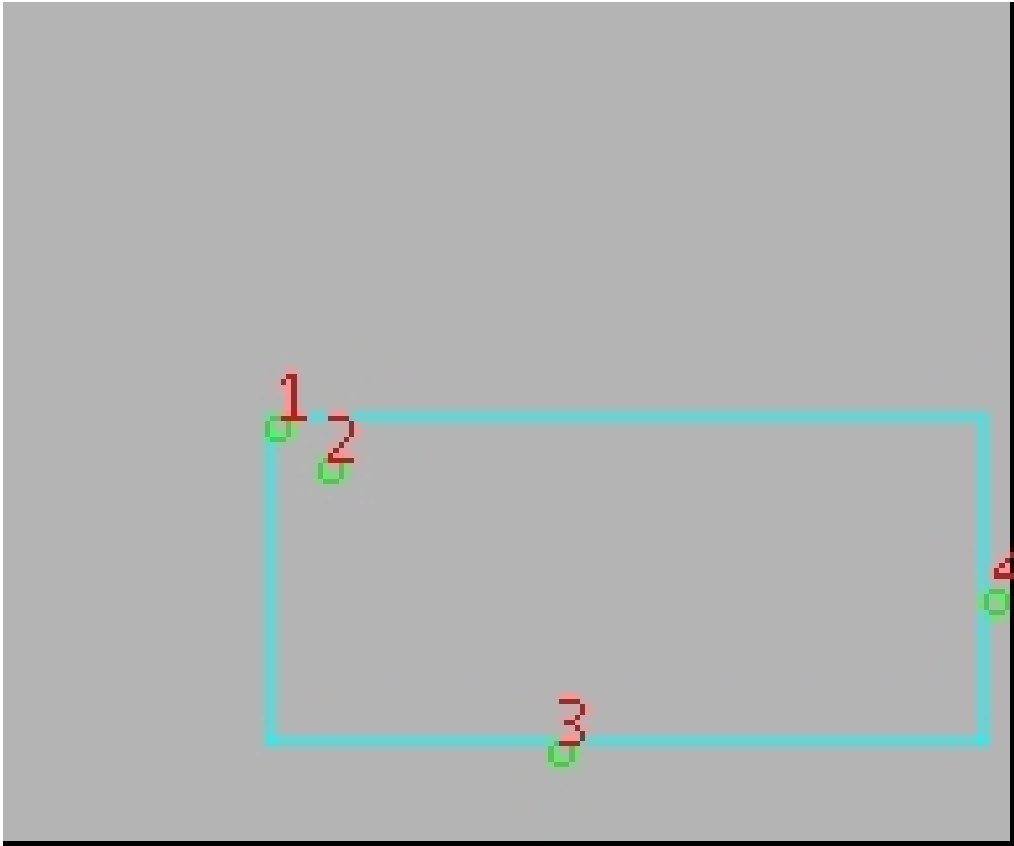


DQE Report: GDQE - Location parameters for INSAT-3D-SND STANDARD Product 3DSND\_24FEB2017\_0300

|               |                |                 |               |                 |          |
|---------------|----------------|-----------------|---------------|-----------------|----------|
| Satellite     | INSAT-3D       | No Of Bands     | 19            | Product Type    | STANDARD |
| Sensor        | SND            | LvlOfProcess    | L1B           | Selected Band   | 2-LWIR3  |
| DOP/Time      | 24-02-17/03:00 | 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 3DSND24FEB20170300L1BSA1

Image Width: 384 Image Height: 320 No Of GCPs: 4

GCP Coverage(%) 38.67 (N-S) 70.96 (E-W)

Location Error(E)

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

Location Error (Km)

|        | Mean    | Direction | Stddev | RMS    |
|--------|---------|-----------|--------|--------|
| Along  | 12.346  | N         | 9.293  | 15.452 |
| Across | -13.273 | W         | 7.043  | 15.026 |

Scale (Km)

|         | Pixel Size | Stddev | %variation |
|---------|------------|--------|------------|
| Average | 10.649     | 0.497  | 6.486      |
| Along   | 10.638     | 0.067  | 6.377      |
| Across  | 10.194     | 0.013  | 1.936      |

Internal Distortion (in Pixels)

|        | PeakToPeak | Mean   | Stddev | RMS   |
|--------|------------|--------|--------|-------|
| Along  | 1.732      | -1.383 | 0.71   | 1.554 |
| Across | 1.166      | 0.483  | 0.53   | 0.719 |

Attitude Residuals (Deg)

| Pitch    | Roll     | Yaw      |
|----------|----------|----------|
| -0.02024 | -0.02334 | -0.46406 |

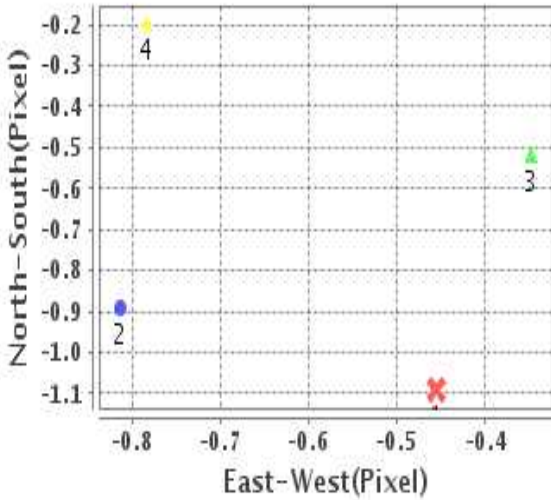
Reference Used

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

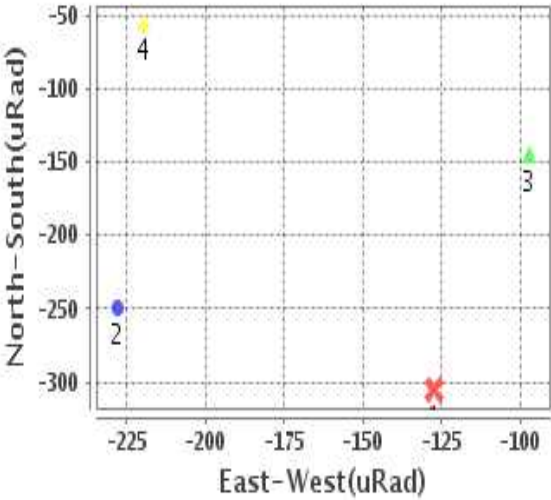
Radial Error (Km)

|      |        |
|------|--------|
| Mean | 20.502 |
| Min  | 11.384 |
| Max  | 29.495 |
| CE90 | 23.095 |

Location Error For GCPs(Pixel)



Location Error For GCPs(uRad)



Detailed Product Information

Ancillary Info

|                   |               |                           |            |
|-------------------|---------------|---------------------------|------------|
| Satellite         | INSAT-3D      | Generation Date           | 24-02-17   |
| Sensor            | SND           | DQE Date                  | 03-03-2017 |
| PassType          | NONE          | Aquisition Date           | 24-02-17   |
| 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_24FEB20 | 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 :** 3DSND24FEB20170300L1BSA1

(-999.99 - Not Available/Not Computed)

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

## Location Accuracy

### GCP Distribution Statistics

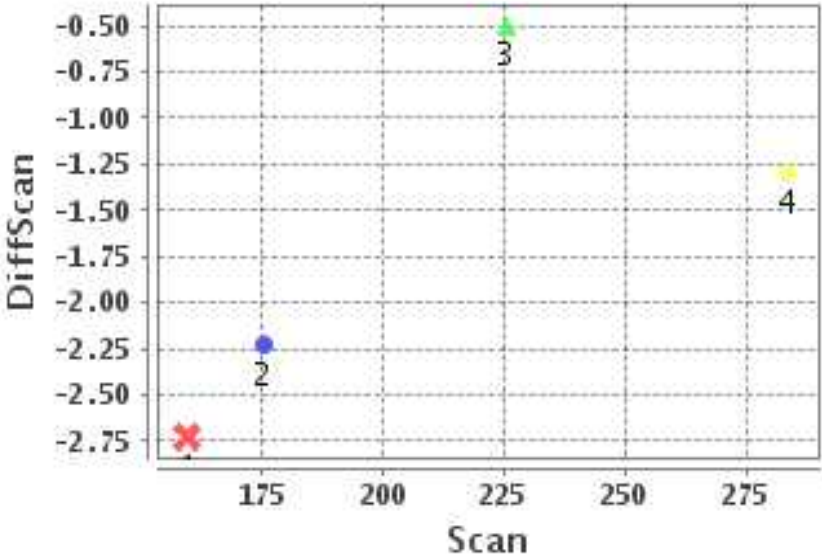
Image Width (pixels) : 384      Image Height (pixels) : 320      No of GCPs : 4

|          | Mean  | StdDev | Min   | Max    | Coverage(in %) |
|----------|-------|--------|-------|--------|----------------|
| GCP Scan | 211.1 | 48.4   | 159.8 | 283.50 | 38.67 (N-S)    |
| GCP Pix  | 201.2 | 107.8  | 101.8 | 374.25 | 70.96 (E-W)    |

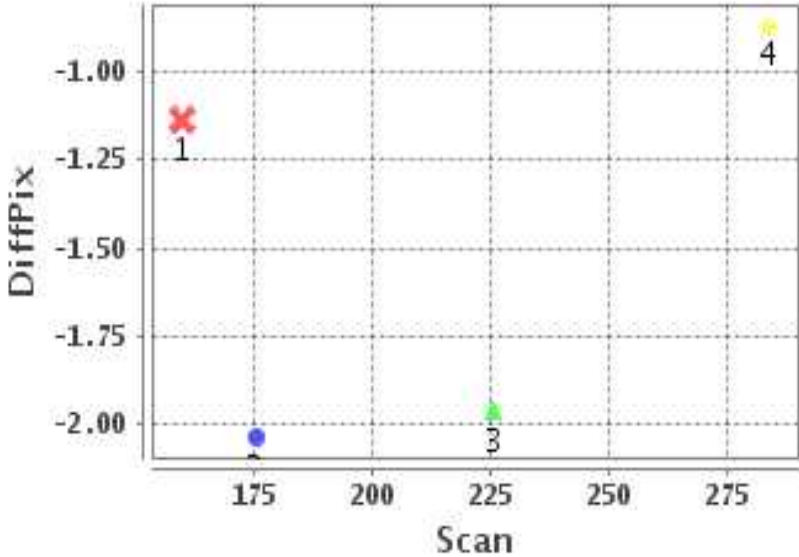
### Identified Control Point details : ( Differences are Reference - Product )

| No | Scan  | Pix   | DiffScan<br>(line) | DiffPix<br>(pixel) | DifLat<br>(Km) | Dir | DifLon<br>(Km) | Dir | Status   |
|----|-------|-------|--------------------|--------------------|----------------|-----|----------------|-----|----------|
| 1  | 159.8 | 101.8 | -2.7               | -1.14              | 22.619         | N   | 4.665          | W   | Accepted |
| 2  | 175.5 | 120.0 | -2.2               | -2.04              | 19.572         | N   | 22.065         | W   | Accepted |
| 3  | 283.5 | 209.0 | -1.3               | -0.87              | 7.755          | N   | 8.334          | W   | Accepted |
| 4  | 225.5 | 374.2 | -0.5               | -1.96              | 0.561          | S   | 18.028         | W   | Accepted |

Error(Pixels) Vs. GCPScan



Error(Pixels) Vs. GCPScan



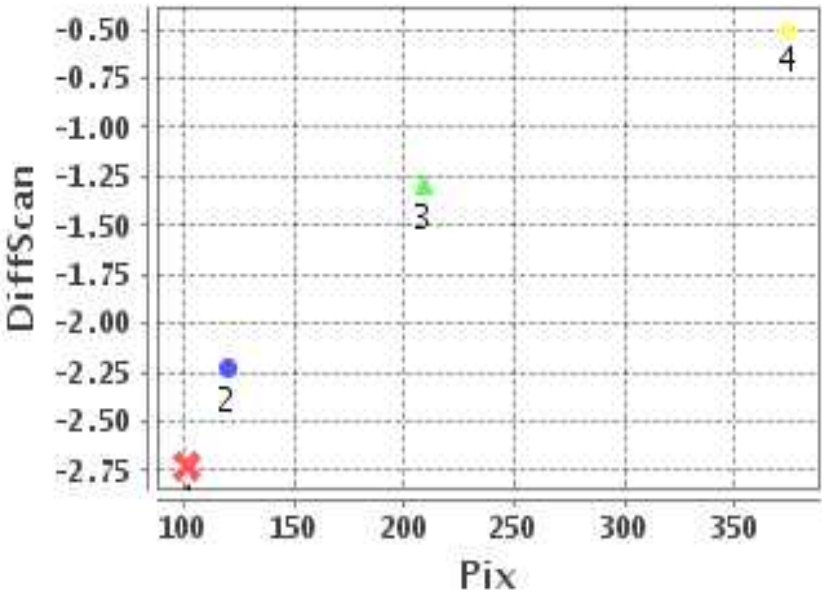
Number Of Points

|       |   |
|-------|---|
| North | 3 |
| South | 1 |
| East  | 0 |
| West  | 4 |

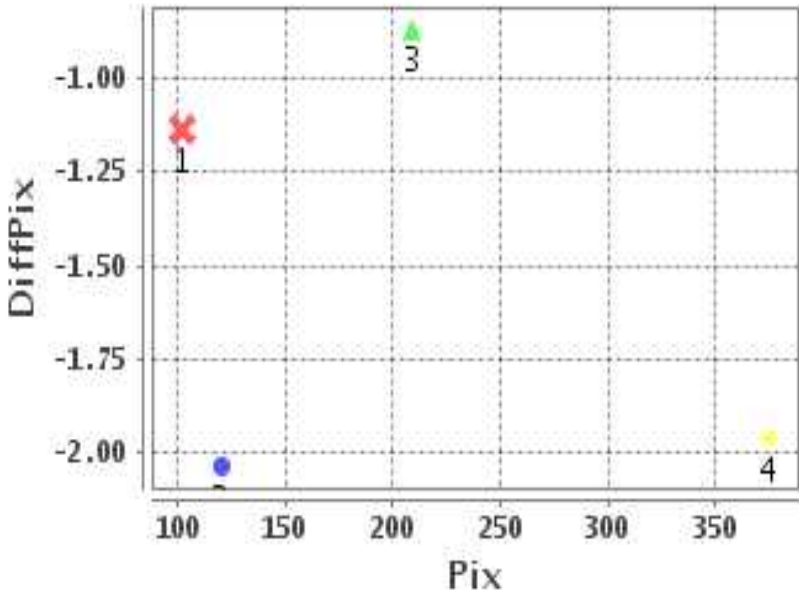
Radial Error ( Km )

|      |        |
|------|--------|
| Mean | 20.502 |
| Min  | 11.384 |
| Max  | 29.495 |
| CE90 | 23.095 |

Error(Pixels) Vs. GCPPix



Error(Pixels) Vs. GCPPix



Location Accuracy

|               | Mean    | StdDev | RMS    | Dir | * MinRMS | * MaxRMS |
|---------------|---------|--------|--------|-----|----------|----------|
| Along( Km )   | 12.346  | 9.293  | 15.452 | N   | 12.159   | 17.840   |
| Across ( Km ) | -13.273 | 7.043  | 15.026 | W   | 11.779   | 17.140   |

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                      | -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-0-127 |        |       |
| Number of GCPs                      | 2      |       |
| Location Error(Km)                  |        |       |
| Along(Mean,Dir)                     | 21.095 | N     |
| Across(Mean,Dir)                    | -13.36 | W     |
| Scale(Km)                           |        |       |
| Average Scale (Mean,%Variation)     | 11.58  | 15.85 |
| Internal Distortion(Pixel)          |        |       |
| Along(Mean,Stddev)                  | -0.50  | 0.00  |
| Across(Mean,Stddev)                 | 0.90   | 0.00  |

| 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                        | -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-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                        | 1       |         |
| Location Error(Km)                    |         |         |
| Along(Mean,Dir)                       | 7.76    | N       |
| Across(Mean,Dir)                      | -8.33   | 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-212-320; Pix Range-255-384 |         |         |
| Number of GCPs                        | 1       |         |
| Location Error(Km)                    |         |         |
| Along(Mean,Dir)                       | -0.57   | S       |
| Across(Mean,Dir)                      | -18.03  | 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 |

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