

## **Initial System Differential Phase Offset/Correction, ST22**

Running **STS > Calibration > Initial System Differential Phase (ISDP)** when light rain is between 5 to 30 km of the radar will yield the best results. This routine should be performed when the PHI data are not near the expected target value of 60° (as of Build 14) and may be required after certain maintenance activities. ISDP adaptation data value, ST22, can be evaluated by viewing PHI data at the near-edge of a rain region. The RPG is content if the visual average of PHI data (at the near-edge of rain) is close to 60°. The Estimated System PHI can be viewed in the RPG Status Log every four hours. It can be viewed at the top of each hour after Build 15. Also planned for Build 15, the RPG will send yellow RPG Status Log messages every volume when the PHI data differ from 60° by +/- 25° or more.

The results of ISDP are stored in ST22. ST22 may range from 0° to 359° and will vary from site to site and channel to channel for redundant systems. The ISDP routine calculates the offset value required to normalize PHI data to 60° so that the RPG receives PHI data values near 60° for rain on the near-side of a rainstorm.

ST22 has a linear inverse relationship with PHI. If ST22 is decreased by 7° then PHI data will increase by 7°. If ST22 is increased by 13° then PHI data will decrease by 13°. Saying another way, if PHI is too high, increasing ST22 will decrease PHI.

### **Potential Impacts when Initial System Differential Phase (ISDP, ST22) is NOT Set to its Optimal Setting for your System**

**PHI at near-edge rain region may not be within ideal range**



**ZDR Attenuation Correction may be Incorrect → ZDR Degraded in AWIPS**

**Specific Differential Phase (KDP) may be Degraded**



**Hydrometeor Classification Algorithm may be Impacted**



**Quantitative Precipitation Estimates (QPE) may be Degraded**

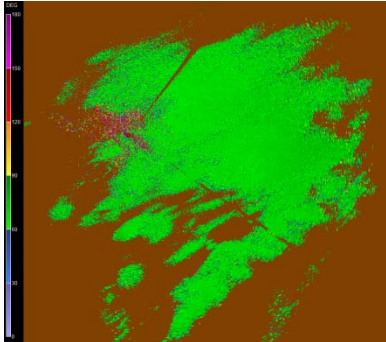
If you suspect PHI issues, please contact the Hotline.

Also, you can refer to the Initial System Differential Phase Procedure in EHB 6-510, Table 6-25

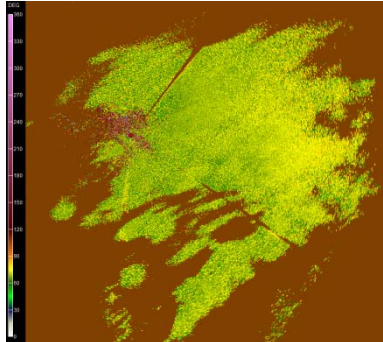
## Examples of PHI from a Build 14 radar

Recall that PHI is a Level II product that can be viewed in Gibson Ridge 2 Analyst (GR2A) and the NOAA Weather & Climate Toolkit (WCT). The images of PHI that follow were obtained using GR2A. Currently, the WCT uses a similar color table to the modified color table shown in the middle images below, where blue is at 25 degrees.

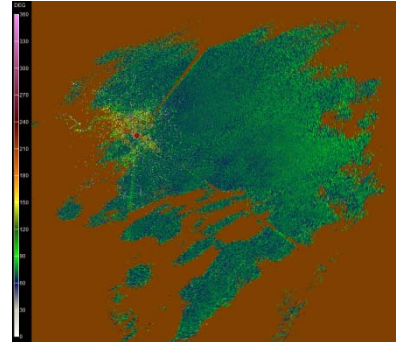
### Illustrations of PHI for correct ISDP:



As displayed with the default color table in Gibson Ridge.

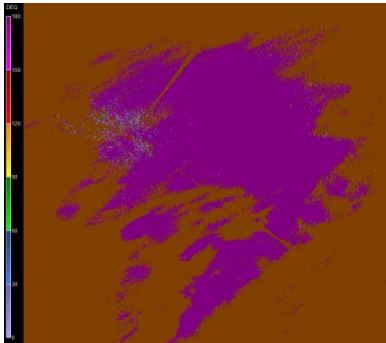


As displayed with a modified color table where 25 degrees is blue.

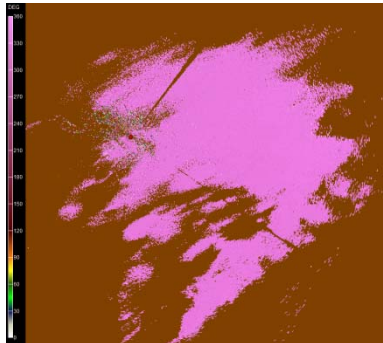


As displayed with a modified color table where 60 degrees is blue.

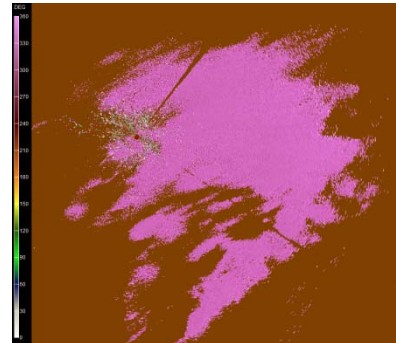
### Illustrations of PHI for incorrect ISDP:



As displayed with the default color table in Gibson Ridge.



As displayed with a modified color table where 25 degrees is blue.

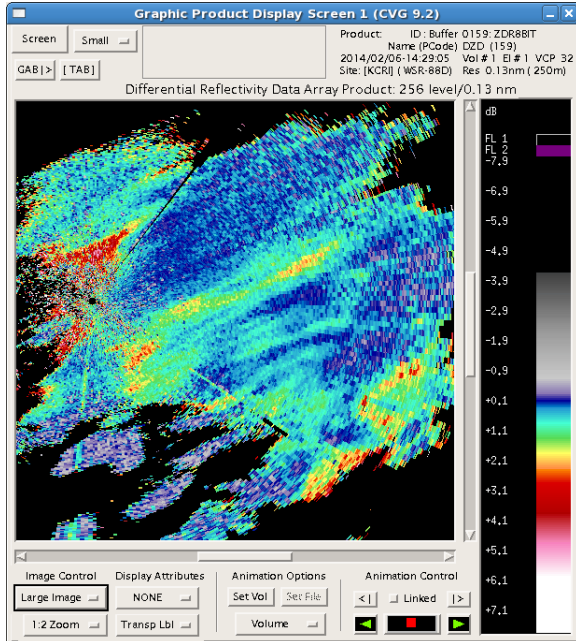


As displayed with a modified color table where 60 degrees is blue.

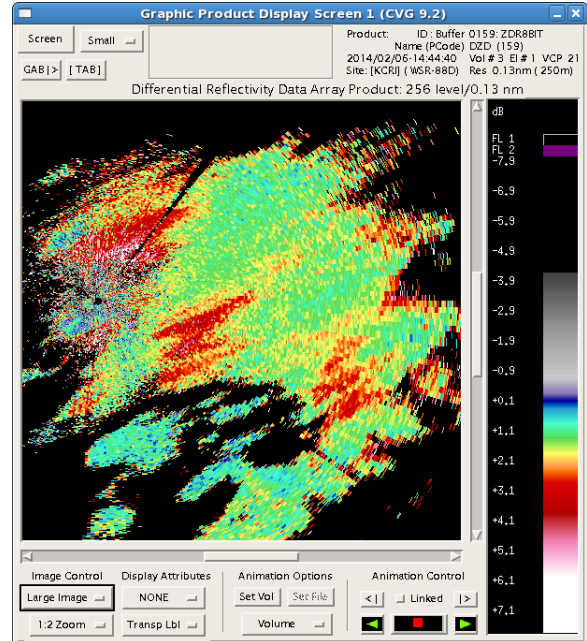
## Impact Examples

Recall that ZDR from Level II will **not** be impacted by ISDP. The following examples are from Level III products.

Illustrations of ZDR (Level III Products, i.e., AWIPS):

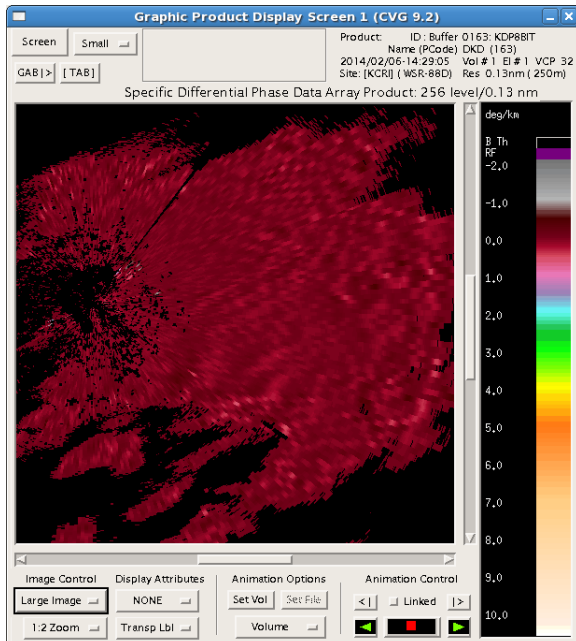


Example of ZDR with a correct ISDP.

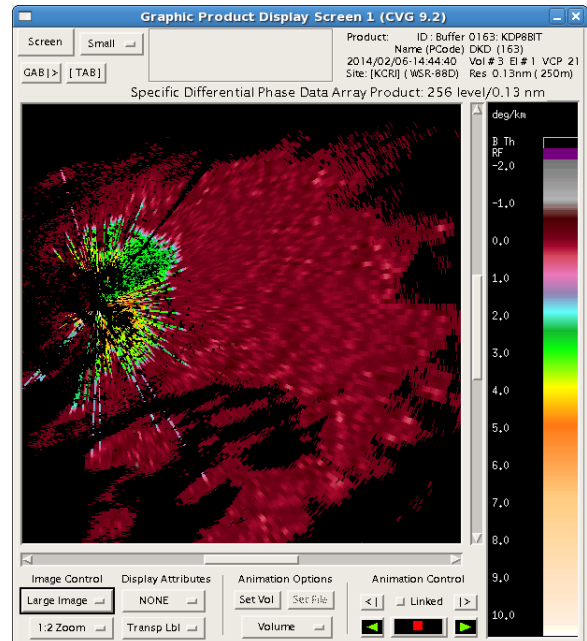


Example of ZDR with an incorrect ISDP.

Illustrations of KDP:

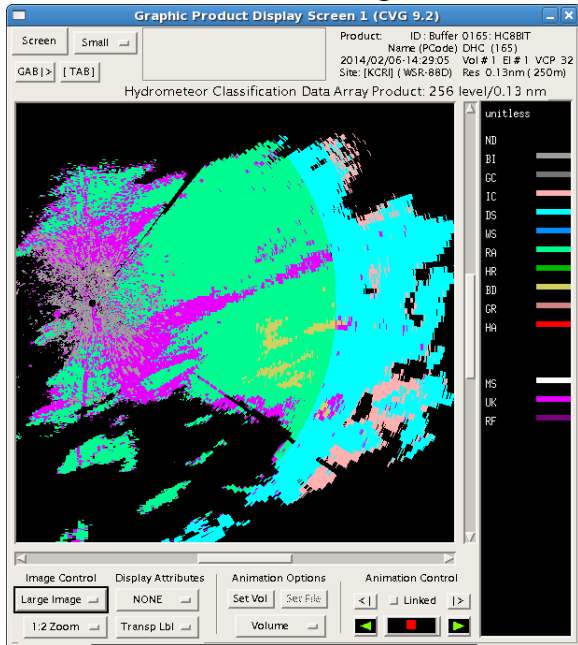


Example of KDP with a correct ISDP.

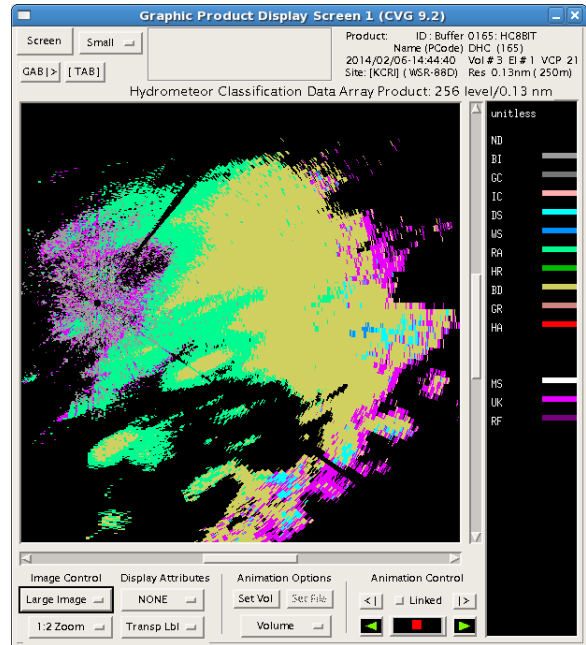


Example of KDP with an incorrect ISDP.

### Illustrations of HCA at 0.5 degrees:

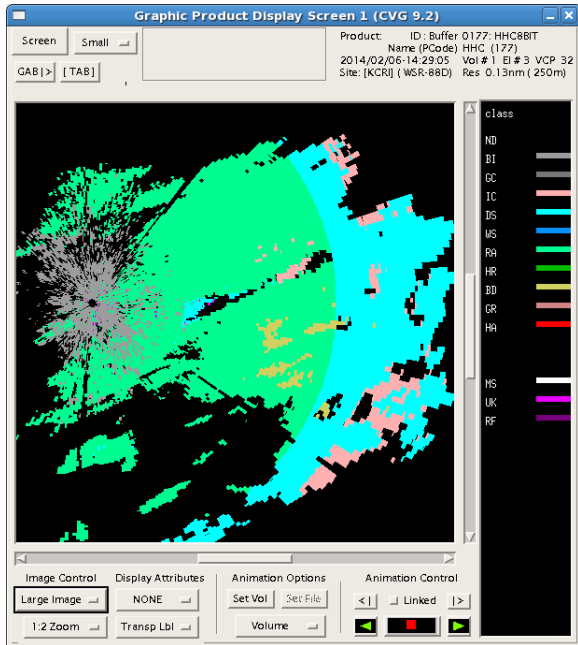


Example of HCA with a correct ISDP.

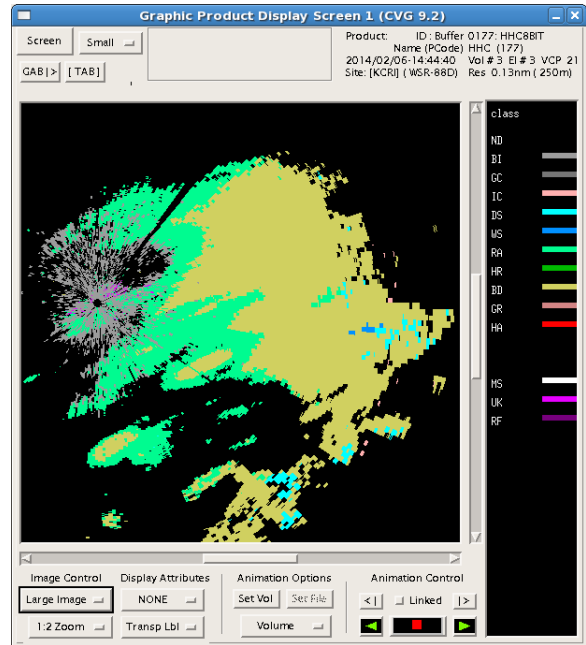


Example of HCA with an incorrect ISDP.

### Illustrations of HHC:



Example of HHC with a correct ISDP.



Example of HHC with an incorrect ISDP.