SCAN/DMD Exercise

Introduction

Follow these steps for a brief exercise on SCAN functionality.

Note: In the following slides, any actions using SCAN or D2D are in a bulleted format, and any actions for this presentation are shown in red.

Click on many of the graphics contained in this presentation for a larger view.

2200: Launch SCAN

To launch SCAN from the main D2D window:

- Start with a display of base radar data (use the **KABR Refl+SRM 0.5** bundle in the **DLOC13_SCAN** procedure).
- Under the SCAN menu, choose the **Storm Cells / Site Storm Threat** option in the **SCAN:kabr** section.

Because most algorithms require the entire volume scan of data, your radar is very likely to be on the next volume scan before you are able to access the SCAN analysis of that volume scan. In our example the current volume scan is 2205 but the most recently-completed SCAN analysis is 2200. To match the algorithms with their base data, you need to sync the SCAN display with your D2D window. To do this:

- Click the Link to Frame button.
- Move the D2D display backwards one frame (use the left arrow key)

2200: Sorting the Table and Time Trends

In most situations, you will want to re-sort the SCAN table.

- Click on a column heading (**hSize**).

The hSize label becomes purple.

In the example, Storm "J0" has the largest hail, according to the algorithm. To find out where Storm J0 is located,

- Click on the **J0** label in the table.

The D2D display should zoom and re-center on Storm J0.

Some people prefer to work with the SCAN table in its vertical orientation. To toggle orientations:

- Click on the **Vert** button in the SCAN table.

One of SCAN's useful functions is to generate time trends of algorithm output. While algorithm performance can change for many reasons other than physical storm changes, it can be helpful to see these time trends. In our example, we'll generate trends of VIL for Storms C0 and P1.

- Click on the cell that contains the VIL value for C0 (67)
- Click on the cell that contains the VIL value for P1 (56).

In the example, note that the y-axis for one of the plots is colored pink. This coloration denotes that the normal y-axis scale for this particular plot has been exceeded.

Now let's generate a trend for the height of the maximum reflectivity (dbzHt) for cell C0.

- Click on the cell that contains the dbzHt value for C0 (19.4).

This height-based trend has light colorations that illustrate the locations of radar beam centerlines of various radar tilts. The height estimates of many algorithm products often become "quantized" to these center line values. Note there is no value in this trend that does not exactly overlay one of the radar tilts.

The time trends update when new algorithm data has been processed by SCAN. If you have the **Link To Frame** button turned on, you may have to adjust the current frame shown in D2D to see the latest trend values.

2205: D2D Display Configuration

SCAN provides some ability to configure the Storm Cell Display of D2D.

- Click the **D2D Display** option in the SCAN **Configurations** menu.

Note how there are three highlighted column headings in the SCAN table. The table is sorted by mdaSR (Strength Rank from the Mesocyclone Detection Algorithm), shown by a purple cell. The two other parameters are used to customize the display (the size of the hexagon symbols and symbol filtering, "cell identifier clutter control"). The example graphic illustrates how the headings correspond to these two customization settings.

- In the Storm Cell Display Identification Parameters Window, change **dbz** in the Cell Identification Clutter Control section to **vil.** Click the **Apply** button.
- Note there are subtle changes to the hexagon display in D2D:
  1. Y1 changes to white
  2. R0 changes to yellow
  3. A2 disappears

The Cell Identifier Clutter Control performs two functions: setting the color of the hexagons and filtering out hexagons for storms that have an attribute lower than the minimum (white) threshold. In this example, we will set the minimum threshold VIL value to 24 and set the red threshold to 64 such that only very high VIL values will be represented with red hexagons.

- Use the left mouse to drag the **white triangle** that represents the lowest VIL threshold so that its value is 24. Click the **Apply** button.
  1. Y1 disappears

- Similarly, drag the **red triangle** that represents the highest VIL threshold so that its value is 64. Click the **Apply** button.
  1. C0 changes to yellow
  2. Only two storm cells are shown to have VIL values at or above 64.

The Radius Range and Radius Interpolation controls allow you to specify the size of the hexagons and relate them to storm cell attributes. This example will specify that 7 nmi hexagon to be equivalent to a VIL value of 60 kg/m2.

- Drag the rightmost **white triangle** for **Radius Interpolation** to 60. Click the **Apply** button.
  1. The hexagon for C0 become slightly smaller.
  2. The hexagons for R0, V1 and Y0 become noticeably smaller.

2214: Launch TVS and MD Tables

Two additional tables can be launched from the main SCAN table. These tables provide additional output from the Mesocyclone Detection (MD) and Tornado Detection Algorithms (TDA). The output from the TDA algorithm is presented in the Tornadic Vortex Signature (TVS) table, while the MD output is in the MESO table.

The attached document, "SCAN Table Attribute Descriptions" contains a list of the most common parameters available in the SCAN tables and their meanings.

These tables have much of the same functionality as does the regular SCAN table, in terms of sorting the table and zooming and re-centering the D2D display on an attribute of interest. Time trends are available for many of the algorithm outputs by clicking on an attribute value in the bottom ("Inspection") row of the table.

- In the D2D display, toggle the radar display to SRM by pressing the "." key.

- In the SCAN table, right-click the column heading for **mdaSR** to launch the MESO table.

- In the MESO table, left-click on a mesocyclone ID number ("317") to re-center the D2D display on the storm that contains that ID. The storm attributes are shown in the bottom row of the MESO table. D2D can be unzoomed by clicking on the ID number in the bottom row of the table.

- In the SCAN table, right-click the column heading for **tvs** to launch the TVS table.

- In the TVS table, left-click on a TVS ID ("1") to re-center the D2D display.

2219: The Digital Mesocyclone Detection (DMD) Table

The SCAN system also provides a table that gives tilt-by-tilt updates of the Mesocyclone Detection Algorithm. This "Digital Mesocyclone Detection" (DMD) table operates in a similar fashion to the other SCAN tables. The zooming, ranking, and time-trend functions operate nearly identical to the regular SCAN table.

- In D2D, open the SCAN menu and click on the **Storm D2D Icons & Table** option in the ***SCAN:kabr*** section.

The DMD table appears along with DMD detection symbols on the D2D display. D2D provides a cursor sampling feature for this data.

- In the DMD Table, click on the table cell that contains ID **208** to zoom the D2D display on the storm cell that contains Mesocyclone ID #208.
- While pressing down the left mouse button, roam around the D2D image near Mesocyclone ID #208.

The DMD table also provides the ability to obtain time-height diagrams of several parameters: **stRank**, **llDiam**, **llVr**, **llShr**, and **llgtg**.

- In the DMD table, right-click on the table cell that contains the **llVr** value for Mesocyclone #208. At 2219 UTC, this value is **56**.

To obtain credit for this exercise, write the keyword for this exercise in your Topic 1 student guide. You will need this keyword for the Topic 1 post-test in the LMS. The keyword for this exercise is: signature