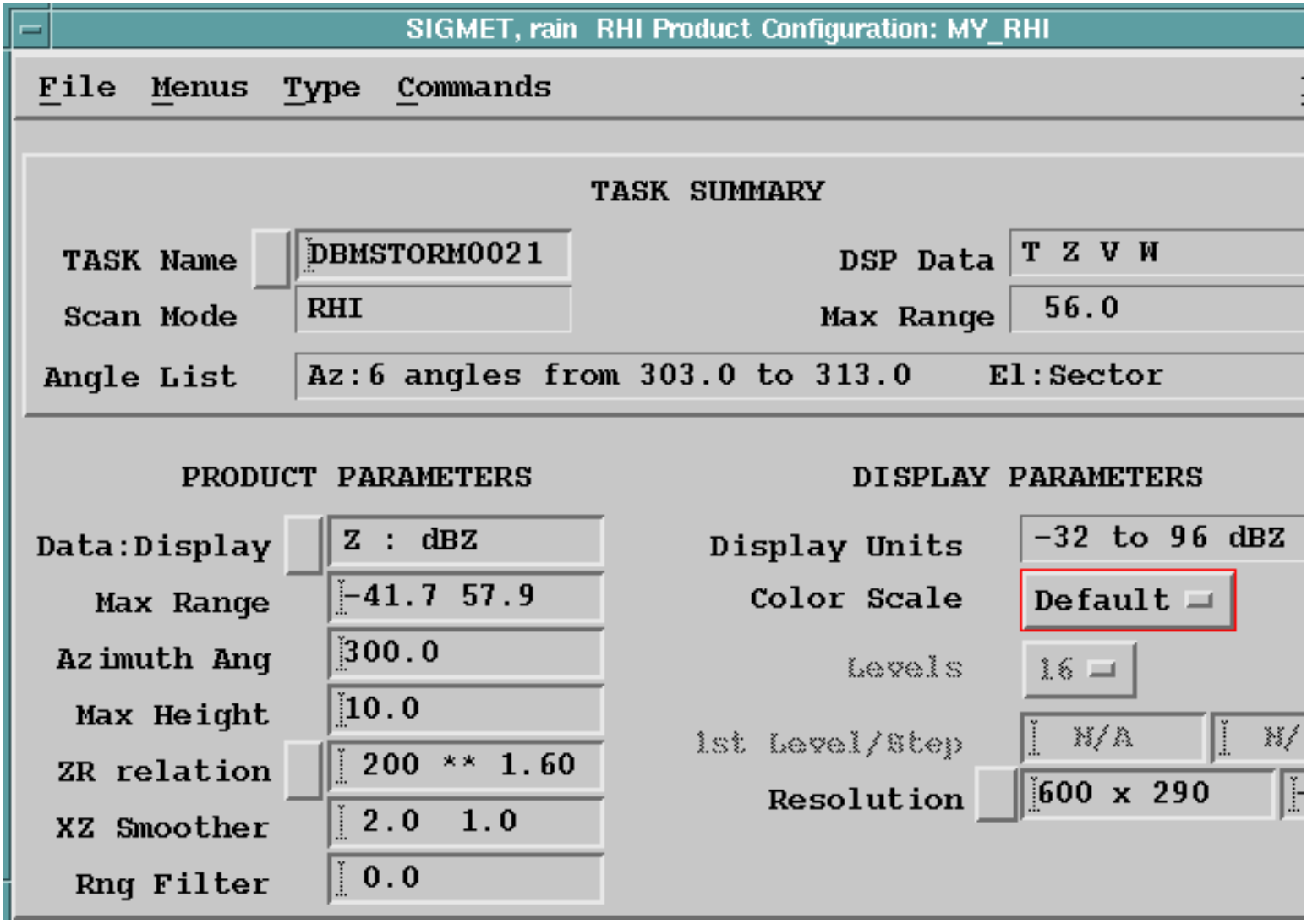
## 2.12 RHI: Range Height Indicator




- Task Summary area, Section 2.1.1.
- Product Parameters, see Section 2.1.3.
- Display Parameters area, Section 2.1.4.

The RHI product is excellent for viewing the detailed vertical structure of a storm. In general, you should schedule the associated RHI TASK through a region of interest. During RHI scanning, the antenna azimuth is fixed and the elevation is swept, typically from near 0 to 90 degrees to create a vertical cross-section effect. If your antenna permits, it is often useful to make an over–the–top RHI task (elevations e.g. –2 to 182). Thus, you get one picture covering two elevations at the opposite sides of the antenna. Negative elevations are most useful in RHI if you select the azimuth to the direction of least beam blocking of the radar horizon.

### To open the RHI Product Configuration menu:

Choose **Type–>RHI** from the menu bar.

### Data : Display

You can choose any of the data types defined in your RHI task, and in addition to that, if you measure V you can select SHEAR ar output data type for radial shear. Radial shear is simply differences between the velocity of successive bins in range. Note that SHEAR is allowed as an output data type to the RHI, but not to other similar products like PPI.

### Max range

You can enter two values in format of xx.x kilometers. If you enter only one, the first one is assumed to be zero. The first limit is the beginning of your display. Zero means the image starts from the radar site. You can enter negative values, then data is picked from another azimuth on the other side of the radar site in the same task, or if your task is scanning over–the–top. You can also enter positive values, especially if you don't use high elevations and you want to avoid the flat corner of a triangular–shaped image. See the chapter Max height about negative elevations.

### Azimuth Angle

RHI product configuration requires that you specify an azimuth angle, which you may not know in advance. This is not a problem — IRIS selects the closest angle at run time, so you are always assured of getting a display. If the associated TASK has only one azimuth angle sweep, that is the angle used for the RHI product.

If you enter * to the field, the product is made for every azimuth in the associated task.

### Max Height, XZ Smoother and Range filter

Specify the Max Height field in XX.X km. Because you specify both the maximum range and height, you can make an RHI at any horizontal-to-vertical aspect ration. Note that the final display will be from 0 to the Max Height above the reference height. The radar is located on the left edge, above the corner if the radar is above the reference. Negative elevation angles will be included in that case. Rays are inserted straight, and the grid of constant height lines is curved to show earth curvature. The X-Z (height) Smoother values can be entered independently in km.

If you have SHEAR as an output data type, it is somewhat noisy, and has to be smoothed with a "range filter". See the documentation in the SHEAR product (Chapter 3.5) for radial shear and range filter for details. This number is unused for data types other than shear.

### Resolution

You can choose Low (288 x 136), Medium (600 x 290), High (840 x 530), or XHigh (1060 x 750) resolution from the Resolution pop-up menu, or enter a resolution directly into the field. RHI's look best with a rectangular resolution.

## RHI or XSECT ?

You can study the three–dimensional structure of the atmosphere with the XSECT and RHI tools. Typically, RHI gives you a much better resolution. If the user of the radar images can control the tasks, then it can be a good idea to define a product configuration in advance (using * for the azimuth), and when something interesting appears, run an RHI task with an azimuth determined with a help of other IRIS products.

If your radars are in a network of several users, or if your task schedule is tight, you perhaps can’t let the users run RHIs whenever they want. Then a cross–section with XSECT product is a convenient option. While RHI has always one point fixed to the radar, a XSECT can be cut through any part of the polar volume. Remember, though, that you cannot get below the lowest elevation !

If you have particular areas of interest, such as paths to runways at an airport, you could run RHIs or XSECTs associated to those in you routine schedule.

## Example

Here is an example of a cumulonimbus seen with RHI from the southern part of the US in summer. The RHI shows clearly that this is a powerful, actively growing Cb with top at 13 km. The echo over-hang and weak echo region on the right indicates a well–organized strong inflow and vertical motion, both characteristic of a severe thunderstorm. The reflectivity core (red is >56 dBZ) indicates a probable hail shaft. Upper level anvil, presumably from another Cb can be seen close to the radar. For detailed vertical structure, there is no substitute for a good RHI.