

2.9 RAIN1: Hourly Rain Accumulation

SIGMET, iris-rel RAIN1 Product Configuration: DEFAULT

File Menus Type Commands Help

TASK SUMMARY

TASK Name: DSP Data:

Scan Mode: Max Range:

Angle List: El:3 angles from 0.0 to 2.0

PRODUCT PARAMETERS

☐ CAPPI

Clutter Map: ☐

ZR relation:

XY Smoother:

Min dBZ:

Minutes:

Gage Cal: ☐ Diag: ☐

DISPLAY PARAMETERS

Display Units:

Color Scale:

Levels:

1st Level/Step:

Resolution:

This section describes the fields of the Product Configuration menu that are unique to RAIN1 products. For general information, see these other sections of this chapter:

- Task Summary area, Section 2.1.1.
- Map Projection Area, Section 2.1.2
- Product Parameters, see Section 2.1.3.
- Display Parameters area, Section 2.1.4.

The RAIN1 product (or Hourly Rain) uses CAPPI or SRI data over a defined time interval, generally 60 minutes, to obtain an estimate of the rainfall that fell within that hour. The results can be displayed or used to derive the RAINN or CATCH product.

A general-purpose volume scan TASK such as the one shown in Figure 2–1 usually serves for the rainfall product. Note that the accuracy of the rainfall product degrades with range because the beam is larger at greater ranges. For example, the beam for a 1 degree beam width is 3 km across at 180 km range. If you have a Doppler radar, select Z as one of the TASK data outputs; this is corrected for ground clutter effects.

To open the RAIN1 Product Configuration menu:

Choose **Type**→**RAIN1** from the menu bar.

CAPPI or SRI

Press the button, to select first the product type (either CAPPI, or SRI), then the name of an input product. The input data type can be corrected dBZ, uncorrected dBZ, or rainfall rate. When rainfall rate data are used, RAIN1 inverts the ZR relation for each file to recover the original Z's, then uses the ZR relation in the RAIN1 definition to compute the rainfall amounts. This means that you can adjust the RAIN1 ZR relation without worrying about old (and possibly different) definitions that were used when making the inputs.

The priority of the RAIN1 product should be lower than that of the CAPPI and SRI products to ensure that all of the inputs are ready before the RAIN1 product is made. Use the **setup** utility's **product** command to set the relative priorities of products.

Clutter Map

This button enables a clutter map feature. To use this, you must make a RAIN1 product with a matching name and resolution in clear weather. This file is then subtracted from each hourly accumulation. The clutter map file is marked using the Product Output Menu.

ZR Relation

The Z-R relationship that you select should be characteristic of the precipitation in your area and account for the type of precipitation, such as rain or snow. Much has been written in the meteorological and hydrological literature concerning the use of radar to estimate precipitation. Consult a standard textbook such as Battan or Doviak and Zrnica to become familiar with Z-R relationships and to understand the advantages and limitations of the technique.

Some standard relationships are:

$Z = 200R^{1.6}$ The Marshall-Palmer relationship for rain

$Z = 2000R^{2.0}$ The Gunn and Marshall relationship for snow

Minimum dBZ

This is the minimum value of dBZ that will be used for computing rainfall amounts, i.e., dBZ values that are less than this will be treated as zero rainfall. This prevents very weak echoes from being counted as rainfall. Typically, this should be set to -10 dBZ, although you should choose a value appropriate to your site. Setting the value to -33 will disable this feature.

Minutes

This is the period of time desired for rainfall accumulation. Generally 60 minutes is used to produce a one hour rainfall product. However, shorter intervals can be used. The minimum accumulation time period allowed is 15 minutes.

Gage Cal

This button is active if you have purchased the IRIS/Hydromet optional software license. Clicking the button configures the product to use a special raingage correction algorithm. See **Appendix F** for a description of the IRIS/Hydromet radar/gage calibration features.

Diag

This button is used only internally for testing.

2.9.1 Scheduling RAIN1 Products

The data times that you specify when you schedule the product are quantized to the time value in the product configuration for the nearest interval that ends the integration. For example, if you want to schedule a 60 minute RAIN1 product to integrate the precipitation in the hour from 11:00 to 12:00, set the time to 12:00. If the associated TASK is running at the end of an hour, the Product Scheduler waits for it to complete, so the TASK data can be included in the hour's integration.

You should set the Skip Time field to 00:00 so the RAIN1 product runs every hour. This is highly recommended because the RAINN product for multiple hour accumulations works best if there is a RAIN1 product every hour.

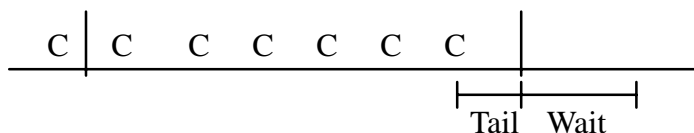
The RAIN1 product must await the arrival of all the input CAPPI's during the accumulation period. The "trigger" is the arrival of a CAPPI that is in the next accumulation period. There are two cases that the product scheduler must handle, i.e., the next hour CAPPI either arrives or it doesn't arrive. These are illustrated below. Note that in the time-line figures below, the horizontal line represents "the data time"- the time of the start of a volume scan. The "C" represents an input CAPPI product. The vertical bar represents an the next accumulation period.

Case 1: Normal Case: Next hour CAPPI arrives



The RAIN1 product is run as soon as a CAPPI from the next accumulation interval arrives.

Case 2: Late Case: Next accumulation interval CAPPI does not arrive



The RAIN1 product runs after the “Tail” and “Wait” times have elapsed. Tail is the time difference between the data time of the last CAPPI and the next accumulation period. The Wait time threshold is configured in IRIS Setup/Product. The Wait time threshold is tuned to account for any network delays. The Wait time is calculated based on the local time of the computer where the RAIN1 product is being run.