Information about Satellite Products on Website

1.Quantitative Precipitation Estimate (QPE)

The technique used here for QPE was developed by Arkin (1979) to estimate tropical precipitation for climatological purposes. Arkin found that radar-estimated precipitation was highly correlated with the fraction of the area covered by pixel colder than 235 K. Of course, the correlation coefficient depends on the area and time over which the precipitation is estimated. Richard and Arkin (1981) tested averaged areas between 0.5x0.5 and 2.5x2.5 latitude and averaging time from 1 to 24h. They found that correlation increases with averaging area and with averaging time.

Arkins and Meisner (1987) call their precipitation estimate GOES Precipitation Index (GPI). They use a 235 K threshold and a constant rain rate R of 3 mm/h. The precise equation is;

$$GPI = Rf\Delta t$$

where GPI is an estimate of the mean rain depth (millimeters) in the area, f is the fraction of area colder than the threshold (235K), and Δt is time in hours for which f applies (e.g. if the images are collected each 1h, then $\Delta t = 1$).

References

Arkin, P. A (1979) . The relationship between fractional coverage of high cloud and rainfall accumulation during GATE over the B-scale array. Mon. Wea. Rev, 107, 1382-1387.

2.Outgoing Long wave Radiation (OLR)

The total amount of the radiation that is emitted from the earth-atmosphere system to the outer space in 3 – 100 μm wavelength bands is called Outgoing Long wave Radiation (OLR).

OLR is an important value for the earth radiation budget. Absorption of solar radiation and emission of terrestrial radiation drive the general circulation of the atmosphere and are largely responsible for the earth's weather and climate.

The Very High Resolution Radiometer (VHRR) infrared channel data has been used for the computation of OLR. The spectral response characteristics of this window channel has been considered for obtaining the OLR flux given by

$$T_f = T_{BB}\,(a + T_{BB}\,b\cos(\alpha))$$

Where T_f is flux equivalent temp in K, T_{BB} is the equivalent blackbody temperature in K measured by satellite, b and a are constants and α is the satellite zenith angle.

OLR is then computed as

$$OLR = \sigma T_f^4$$