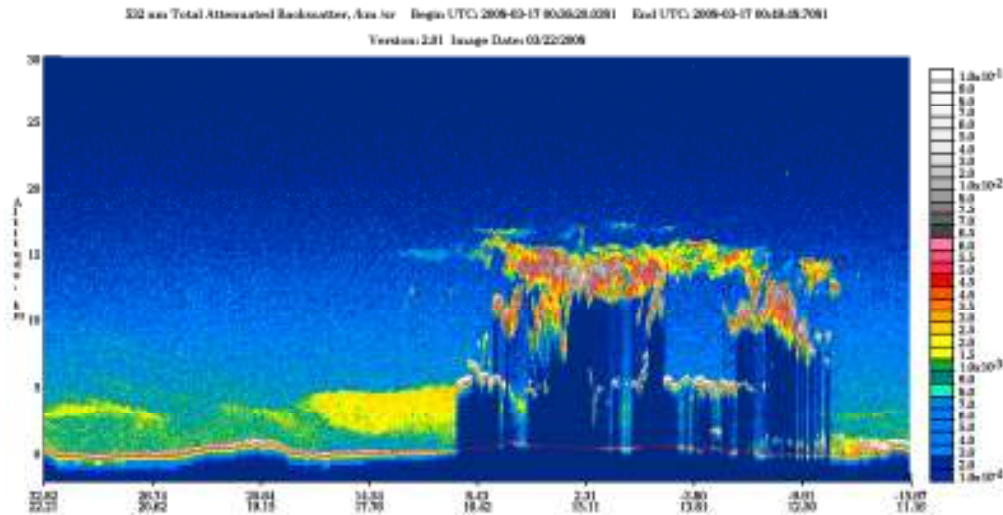
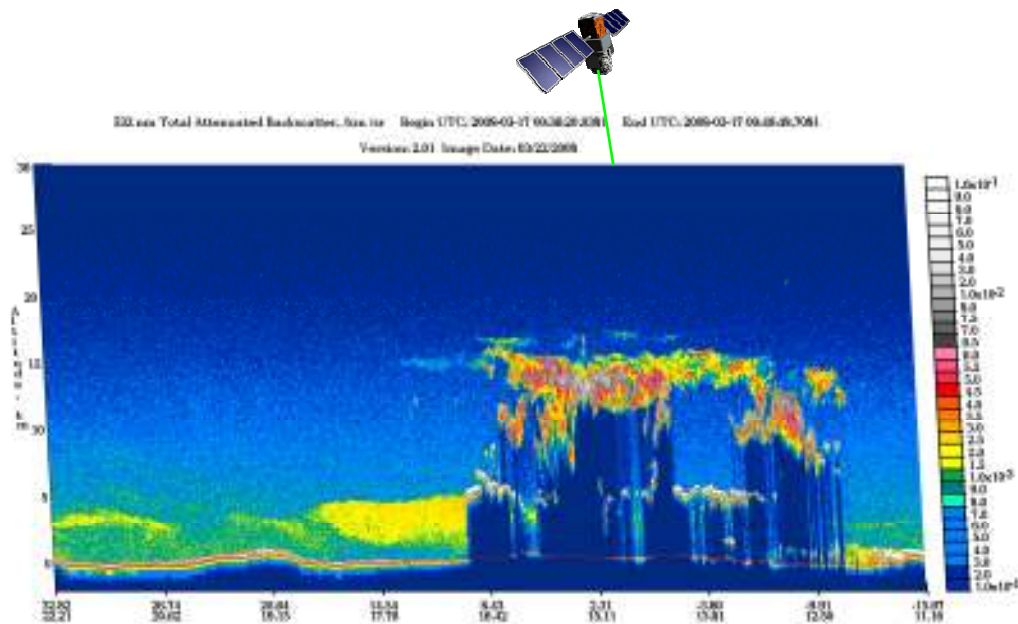


Prior to November 28, 2007, CALIPSO was nominally pointed in a 'near nadir' direction (actually at  $\sim 0.3^\circ$  off nadir, to avoid the full force of specular reflections from still waters and horizontally oriented ice crystals). In that pointing configuration, our browse images – as shown below – correctly represented both the spatial distribution of clouds and aerosols, and the optical effects of overlying layers on the atmosphere below.



Now, however, we're pointed at  $3^\circ$  off-nadir, with the tilt being in the same plane as the satellite velocity vector (i.e., along track, rather than off to the side somewhere). As a result, the spatial distribution of layers is not quite the same as is shown in our browse image. A more faithful representation might look like this...



There are several things that a 'concerned user' might want to note here:

1. While there is now a 3° vertical shear in the spatial distribution of clouds and aerosols (i.e., as shown above), the optical effects of overlying layers are still correctly represented by the original, upright images that are being shown on our web pages.
2. The altitudes reported in all products are still measured with respect to a nadir viewing instrument, and thus users need not (and should not) make any corrections for pointing angle.
3. The laser footprint locations reported in the data products give the coordinates of the beam location on the Earth at mean sea level; i.e., for figuring out the measurement geometry, the reference point is given by the latitude and longitude coordinates provided in each data product.
4. The horizontal offset between any two points in the vertical can be computed using 'triangle trig'. If the vertical distance is  $V$ , the horizontal offset,  $\Delta h$ , between the upper and lower points is  $\Delta h = V \cdot \tan(3^\circ)$ .
5. Version 2 of the data products includes a new 'Spacecraft\_Position' SDS that contains the all of the spacecraft attitude information required to vertically collocate the CALIPSO and CloudSat profiles. This was included at the request of the CloudSat team, specifically for the continued production of their GeoProf products.
6. In general, the optical properties reported for measurements of aerosols and water clouds are not expected to change as a function of the change in pointing angle. However, the properties reported for individual ice clouds will change by some varying amount, depending on the concentration of horizontally aligned ice crystals present in the cloud. Among the changes that can be anticipated are
  - a reduction in the maximum values of integrated attenuated backscatter measured at both wavelengths;
  - an increase in the minimum depolarization ratios associated with strongly scattering ice clouds;
  - a small change in the proportion of clouds classified as ice versus those classified as water; and
  - an increase in the minimum lidar ratios retrieved for strongly scattering ice clouds.