

Probability of Cloud-Free-Line-of-Sight (PCFLOS) from CloudSat and CALIPSO Cloud Mask

Notes on the prototype CloudSat/ CALIPSO PCFLOS web viewer:

This is a prototype product that is generated from CloudSat and CALIPSO cloud mask products (CloudSat 2B-GEOPROF and 2B-GEOPROF-Lidar). CFLOS observations are generated with the following assumptions/background information:

1. View angles are given as the angle displacement from Nadir. For comparison with standard, passive, cloud fraction analyses ... one can select the top level and a view angle of 0 (see note 2 below).
2. PCFLOS displays indicate the probability of a cloud-free-line-of-sight. This is the inverse of standard cloud fraction. From the highest level and a view angle of 0 degrees (nadir), a PCFLOS of 30% will be equivalent to a cloud fraction of 70% (0.7).
3. A Cloud-Free-Line-of-Sight is flagged when one can view, along a line of sight of at least 25km, without seeing an intervening cloud. This distance is arbitrary and can easily be modified for specific applications. 25-km was chosen because it is generally considered to be the cloud-free distance that is of interest for aviation applications.
4. In the case where the sight vector intersects the earth surface in less than 25km, a CFLOS is indicated if no clouds are encountered between the view point and the earth surface.
5. CFLOS calculations are done in both the forward and rear directions along the CloudSat orbit track. This is done to both increase the number of observations, and to account for varying direction of cloud advection over the global domain (CloudSat and CALIPSO reach a maximum latitude of +/- 82 degrees). In some domains the cloud advection will have a component in the direction of flight and in others it will be opposed to the direction of flight. The PCFLOS, thus, includes both the forward and backward views.