

Visible and IR features at storm top as observed by meteorological satellites

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Abstract

Satellite observations provide extremely useful data for weather forecasters especially for locations where no other weather data are available. This is especially important for severe storm forecasters as many storms occur at places without any conventional or radar data coverage. But satellite data are obtained by remote sensing techniques and need to be correctly interpreted to render them useful. This seminar will discuss the physics behind several storm top features as observed by meteorological satellites that are useful for forecasters. I believe that the more forecasters understand the physics of these features, the better they can use them for their storm forecast.

In this seminar, I will discuss several visible and IR features associated with severe storms as seen by satellites. These include: cold-U or V (also called enhanced-U or V), close-in warm area (CWA), distant warm area (DWA), cold ring, overshooting top, jumping cirrus, above anvil cirrus plumes, storm top ship waves, pancake clouds, and radial cirrus feature. I will show typical examples of these features. Most of these features can be explained by the interaction between the ambient winds and the storm updraft. Of particular importance is the internal gravity wave excited by the deep convection. I will explain the physics responsible for these features using numerical cloud model simulated storm results and the implications of these features for storm nowcast and forecast.