



Detection of multi-layered clouds is important for obtaining accurate trace gas retrievals, evaluating model cloud parameterizations, and calculating radiative forcing. Multi-layer clouds can also present difficulties for trace-gas remote sensing, particularly when the gases are not well mixed (as is the case for NO_2 , SO_2 , HCHO , etc.). We need to be able to detect such problematic cases. We can do this using complementary information from OMI and MODIS (or with MODIS alone, using its shortwave H_2O channel). The figure presents the fraction of OMI cloudy pixels containing distinct multi-layer clouds, July 2007. MODIS cloud-top pressure (sensitive to the physical cloud top) and OMI optical centroid cloud pressure (sensitive to bright lower cloud decks) are used to detect multi-layer clouds with good spatial coverage. The approach is tuned and validated using CloudSat radar data. (Adapted from Joiner et al., 2010). Courtesy: Joanna Joiner (NASA).