Applications for Near-Real Time Satellite Cloud and Radiation Products

**Introduction**
With increases in computer capabilities & satellite imager data availability, near-real time (NRT) products generated from satellite data are becoming more common & finding more applications. At NASA LaRC, we have been providing satellite-based cloud and radiation parameters in NRT for over a decade. As these analytical datasets become more widely known, researchers have been using them to improve their nowcasts and forecasts of weather and other atmospheric phenomena. The products, their availability and some of their current applications are summarized in this poster.

**Availability**
On the web: [http://cloudsgate2.larc.nasa.gov](http://cloudsgate2.larc.nasa.gov)

**Products**
All products are available at pixel level; some are also averaged to particular grids. Averaging is flexible. 

- **Standard, Single-Layer VISST/SIBT**
  - 0.65, 1.6 µm Reflectances
  - 3.7, 6.7, 10.8 µm Temp
  - 12 or 13.3 µm Temp
  - Optical Depth, LIW, Effective particle size
  - Liquid/LIW Water Path
  - Cloud-top Topography
  - Effective Temp, height, pressure
  - Top/Bottom Pressure
  - Mask, Phase
  - Liquid/Ice Water Path
  - Cloud effective particle size
  - Effective Temp, height, pressure

- **Multi-Layer ID (single or 2-layer)**
  - Effective temperature
  - Optical depth, thickness
  - Ice or liquid water path

- **Effective particle size**
  - Ice or liquid water path

- **Overshooting tops**
  - Top/Bottom Pressure
  - Overlapping tops (new)

- **Top/Bottom Pressure**
  - Top/Bottom Height

- **Clear-sky Skin Temperature**
  - Bottom Pressure

**Other applications**
- Field program support: over 35 experiments supported (see website sidebar)
- Potential clear-sky applications: e.g., surface albedo, aerosols, etc.
- Remote Sensing: surface skin temperature, broadband OLR, m Temp, 3.7, 6.7, 10.8 µm Reflectances, RGB, b) multilayer ID, c) Lower cloud height (km), d) Upper level height (km)

**Assimilation & Forecasting**

- **Airframe Icing Potential**
  - Top/Bottom Pressure
  - Overlapping tops (new)

- **Convective & Lightning initiation**
  - Lightning

- **Overshooting Tops**
  - Lightning

**Applications**

- **Surface radiation budget, solar energy**
- **Effective particle size**
- **Ice or liquid water path**
- **Cloud effective particle size**
- **Effective Temp, height, pressure**
- **Optical Depth, IR emissivity**
- **Mask, Phase**
- **Liquid/Ice Water Path**
- **Cloud effective particle size**
- **Effective Temp, height, pressure**

**References**
- T. A. Jones, NASA/GSFC, Greenbelt, MD
- R. Reichle, M. Rienecker, A. da Silva, P. Norris, NOAA/ESRL, Boulder, CO
- Mecikalski, J. R., P. Minnis, and R. Palikonda, 2012: Use of satellite derived cloud properties to quantify growing cumulus to aircraft using single-layer cloud parameters derived from operational satellite data.
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