HGB Meteorological Model Performance Evaluation: PBL, $k_v$ and Cloud Cover

Southeast Texas Photochemical Modeling Technical Committee

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Modeled $k_v$ and PBL Depth vs. Observed PBL Depth

- Vertical diffusivity ($k_v$) is used by CAMx to mix between vertical layers of the model.
  - Derived from MM5 output by the MM5CAMx program.

- Planetary Boundary Layer (PBL) depth shown here is derived from the $k_v$s.

- “Observed” PBL depth used in this comparison was estimated from radar profiler data.
$k_v$ & PBL Depth, 5/19/05-6/3/05

**Vertical Diffusivity $k_v$ (m$^2$/s) (05/19/2005-06/03/2005)**

LAP3 at (477.1, 1115.3) km (EPA482011043, C243, 2005/06/09-now, La Porte Airport, 10725 North Main, La Porte, Harris Co., TX)

HUTV at (420.2, 998.8) km (EPA484715012, C5012, 2005/08/01-now, Huntsville KJTS, Huntsville Municipal Aport, Huntsville, Walker Co., TX)
$k_v$ & PBL Depth, 7/26/05-8/8/05

Vertical Diffusivity $k_v$ (m²/s) (07/26/2005-08/08/2005)

LAP3 at (47.71, 111.53) km (EPA48211043, C243, 2005/06/09-nw, La Porte Airport, 10725 North Main, La Porte, Harris Co., TX)

Vertical Diffusivity $k_v$ (m²/s) (07/26/2005-08/08/2005)

HUTV at (42.0, 98.8) km (EPA48475012, C5012, 2005/08/01-nw, Huntsville KJTS, Huntsville Municipal Airport, Huntsville, Walker Co., TX)
Modeled Cloud Fraction vs. Satellite Observed Clouds

- Modeled cloud fraction is output from MM5.

- Observed cloud cover used for comparison is GOES IR imagery.
The PBL varies with land use, and is affected by cloud cover and winds.

Side-by-side comparisons of modeled PBL & cloud fractions, overlaid with winds, provide insight into the complex inter-relationships among these variables.