POTENTIAL FAB CONTRIBUTIONS TO HWT

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Acknowledgements:
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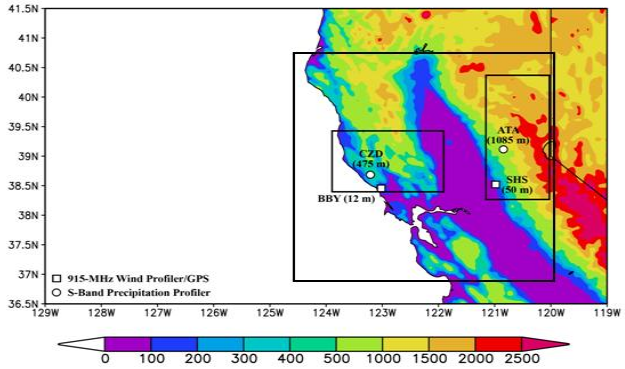
FAB EXPERTISE RELEVANT FOR HWT

- Fine scale initialization
  - LAPS, STMAS
- Microphysics parameterization
  - Intercomparison of various schemes
  - Tuning / sensitivity analysis
    - Large influence on precipitation
- Cloud top temperature satellite look-alike for NWP forecasts
  - Product for forecasters
  - Evaluation tool for testing microphysics schemes
- Experimentation with fine scale ensembles
  - Impact of boundary conditions
  - Impact of model configuration
  - HMT and other applications
- Verification of NWP forecasts
  - Feature-based and other approaches
- Statistical post-processing of ensembles
  - Precipitation and other variables

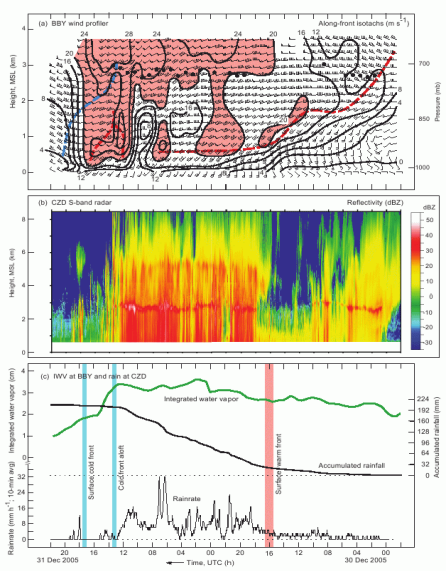
*Evaluation and Comparison of Microphysical Algorithms in WRF-ARW Model Simulations of Atmospheric River Events Affecting the California Coast 2009:JHM, **10**,847-870*

SIMULATIONS

- 5 “atmospheric river” events
- 3km WRF-ARW
- 4 different Microphysics (Lin, WSM6, Thompson & Schultz)

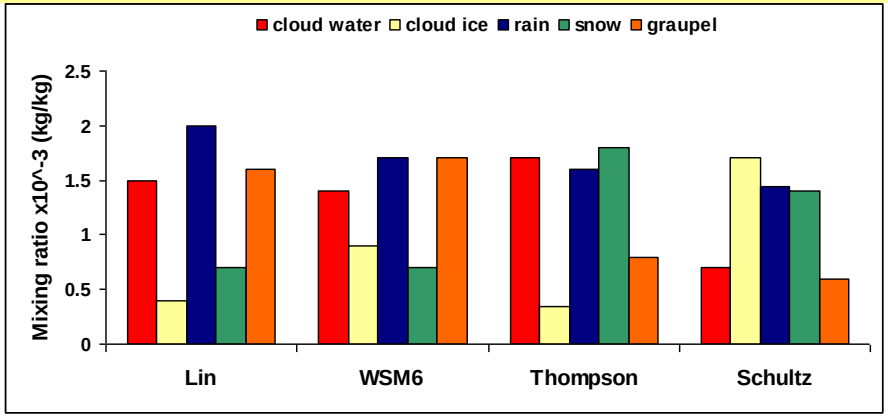


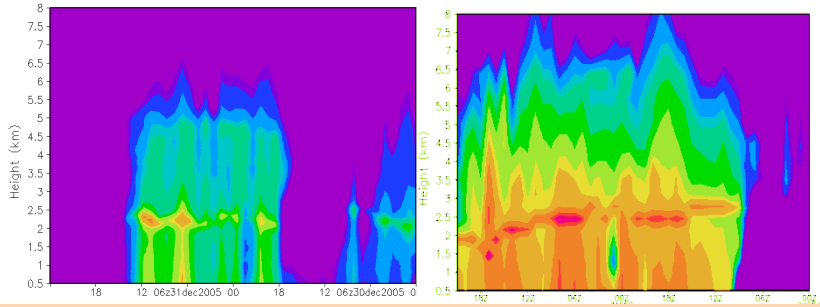
Integration domain



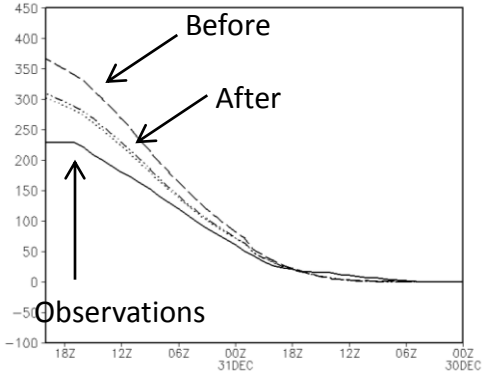
The model showed a tendency to overestimate the upslope wind component duration and intensity as well as moisture content.

MICROPHYSICAL ASSPECTS: WATER SUBSTANCE PARTITION





Comparison of synthetic reflectivity to S-band Radar Data (Obs. vs. Thompson)

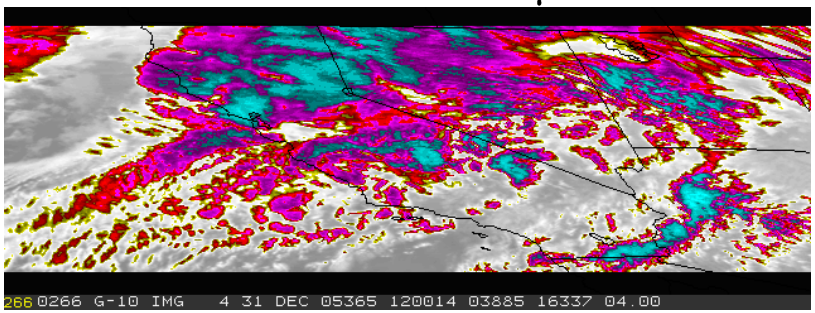


~50% decrease in precip. overestimation from model run using Lin scheme after adjusting some parameters (e.g. snow accretion of snow by graupel and lowering the threshold for conversion of snow to graupel)

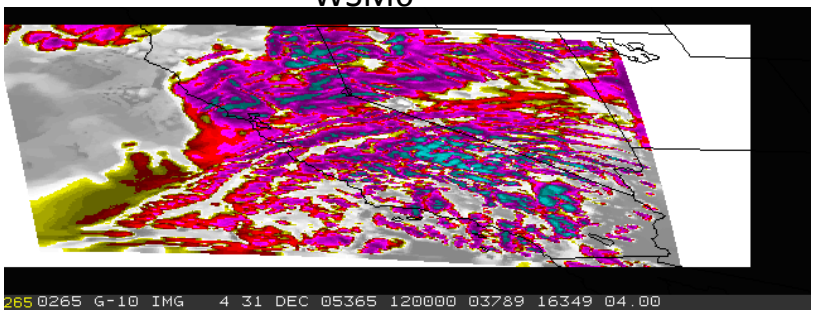
Possible use of synthetic satellite imagery, as an additional way to indirectly evaluate the performance of various microphysical schemes, was evaluated.

24-hr forecast valid at 31 Dec. 2005 at 12 UTC

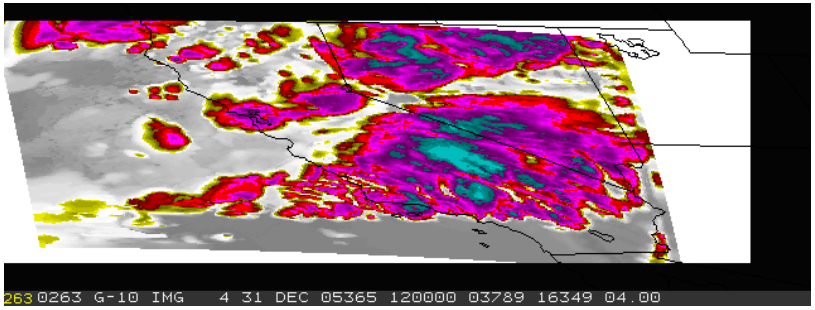
Observations-GOES-10 10.7μm

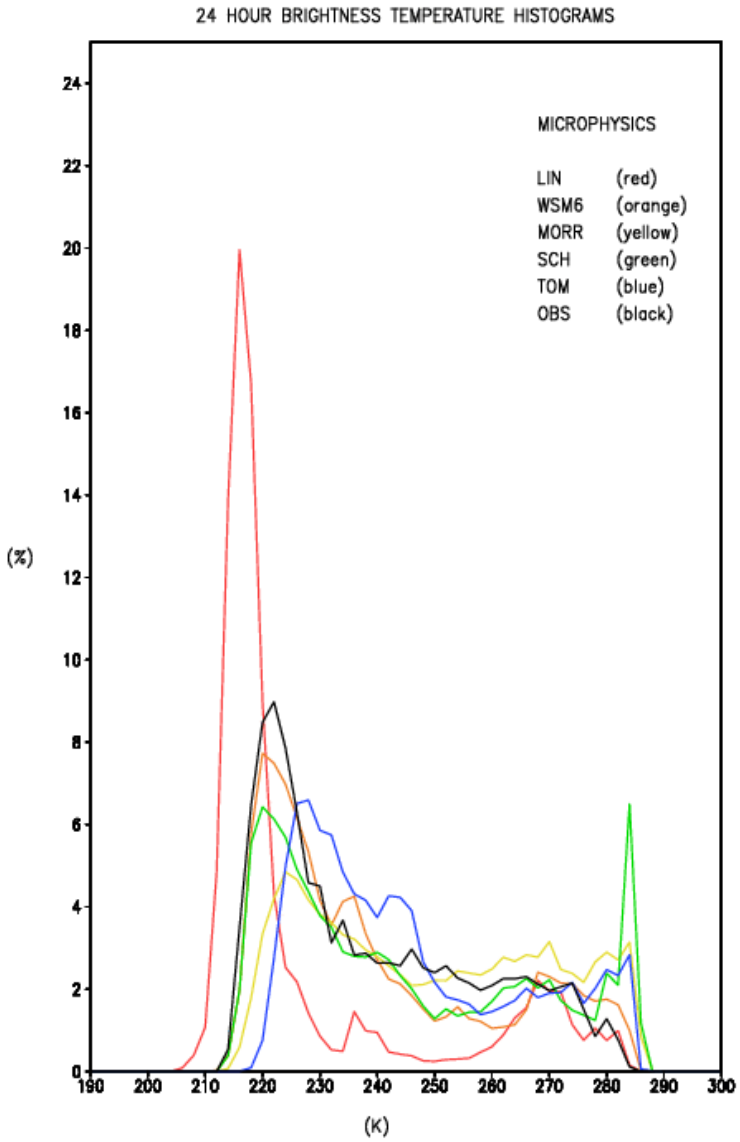


WSM6



Schultz





Isidora Jankov and Louie Grasso

POTENTIAL NEW CONTRIBUTIONS

- Stochastic parameterization
  - Sensitivity analysis of schemes relevant for severe weather prediction
  - Enhance schemes to incorporate capability to simulate forecast uncertainty

- Storm-scale initialization using ensemble-based covariance information
  - Consider methods capable of handling strongly non-linear / non-Gaussian situations

- Studies aimed at improved statistical post-processing methods
    - Consider regime dependent corrections using Bayesian approach

- Products and decision support
  - Study best ways of communicating forecast with uncertainty info to users
  - “Ensemble mean” with realistic temporal and spatial variance