Integrating Wind Profiling Radars and Radiosonde Observations with Model Point Data to Develop a Decision Support Tool to Assess Upper-level Winds For Space Launch

William H. Bauman III
NASA Applied Meteorology Unit
ENSCO, Inc.
Cape Canaveral Air Force Station, Florida

Clay Flinn
USAF 45th Weather Squadron
Patrick Air Force Base, Florida

Outline

• Problem
• Data
  – Observations
  – Model Point Data
• Graphical User Interface (GUI)
  – Model Initialization
  – Model Forecasts
    • Profilers
    • Rawinsonde
• Conclusions
Problem

- **Launch Directors**
  - Want to know upper-level wind forecasts during launch countdown
  - Steering, aerodynamic loads and trajectory
- **Launch Weather Officers**
  - Should be able to provide the forecasts
  - Limited capability
- **Solution**
  - Develop GUI
  - Overlay vertical profiles of observations and model data

Observations & Model Data

- KSC
- 50 MHz Profiler
- 915 MHz Profiler
- CCAFS
- AMPS Rawinsondes
- Model Point Data
- RAP, NAM, GFS
Launch Weather Officers requested Excel GUI
- Windows PC workstation located in Range Weather Operations
- All code written in Visual Basic for Applications
Model Initialization

Wind Speed

Wind Direction

Model Initialization

Applied Meteorology Unit

http://science.nasa.gov/amu

11/30/2012
Model Initialization

Wind Speed vs. Height

Wind Direction vs. Height
Model Initialization

Model Forecasts – Profiler
Model Forecasts – Profiler

Wind Speed

Wind Direction

Model Forecasts – Profiler

Applied Meteorology Unit

11/30/2012
Model Forecasts – Rawinsonde

Applied Meteorology Unit

http://science.nasa.gov/amu

11/30/2012
Model Forecasts – Rawinsonde

Conclusions

- Launch directors need to know upper-level wind forecasts
- Developed an Excel-based GUI to display upper-level winds
  - Rawinsonde at CCAFS
  - Wind profilers at KSC
  - Model point data at CCAFS
Questions?