FAA PMR’02

Jian Zhang
Real-time CIWS Mosaic

Composite Reflectivity at 10:40am EDT on 10 Oct 2002
Real-time CIWS mosaic (FY02)

- Real-time grid data (in NetCDF format) are available via sftp
TDWR work (FY02)

- 3D reflectivity mosaic with WSR-88D tested offline
  - Different resolution
  - Different calibration?
WSR-88D and TDWR reflectivity mosaic

Horizontal cross section
At 1km above msl.
TDWR refl vs. WSR-88D refl

KTLX
Coarser resolution
~4 dB “Hotter”

OKC TDWR
Finer resolution
“Cooler”?
TDWR work (FY02)

- TDWR Bright-band identification (BBID) implemented

- One BB case captured (Oct. 28, 2002)
  - BB identified by both WSR-88D (KTLX) and TDWR (OKC)
  - Results different between 88D and TDWR due to:
    - Beam-width
    - Gate spacing
    - Location
  - BBID parameters need to be adjusted for applying to TDWR data
WSR-88D and TDWR brightband vs. RUC 0°C heights
Future TDWR work

Future work

- More case studies
- Find optimal BBID parameters for TDWR
- Nested, high resolution grid may be necessary for mosaicking TDWR data
4D Dynamic Grid

- **Current 3D Mosaic (FY02):**
  - Update every 5 minutes (volume-based)
  - Reflectivity only

- **Rapid Update Mosaic (FY03):**
  - Tilt-based update cycle (10~30 seconds)
  - Beam filling and spreading via Barnes weighting function
  - Range-dependent temporal weighting function
  - Reflectivity and derivatives
  - Velocity derivatives
Preliminary 4D dynamic grid results

- **Current 3D mosaic vs. rapid update mosaic**
- **Case:**
  - Oklahoma, 14 Aug, 2002, convective storms
  - 2 radars: KTLX and KFDR
  - Time: 01:17:00Z to 01:30:01Z
- **Demo:**
  - Composite reflectivity loops
  - Vertical cross sections along two lines
    - Line 1: KTLX-KFDR baseline
    - Line 2: through core of fast developing storms
Current 3D mosaic comp. refl.
(every 5 min)

01:20Z - 01:30Z, 2002-08-14

KFLX

KFDR
Rapid update mosaic comp. refl. (every 10s)

01:20Z - 01:30Z, 2002-08-14

KTLX

KFDR
Lines for vertical cross sections
Cross section-1 loop (~ every 10 s)

01:17:00Z - 01:30:01Z, 2002-08-14
Cross section 2 loop (~every 10s)

01:17:00Z - 01:30:01Z, 2002-08-14
4D dynamic grid future work

- Future work related to 4D dynamic grid
  - Range-dependent time weighting (FY03)
  - Improved AP and clear air clutter removal (FY03)
  - Derived reflectivity and velocity products (FY03)
    - Wind shear
    - Time tendency
  - Severe storm algorithms (FY04)
  - Motion adjustment/synchronization (FY04, 05)

- Satellite and model data overlay
- 3D lightning map overlay