**Introduction**

• To produce a high-resolution 4D assimilated data set that is consistent with the dynamical and thermodynamical processes of the atmosphere.
• To provide more realistic meteorological conditions in supporting extensive modeling and validation studies.
• To provide “a continuous movie of the atmosphere” for characterizing cirrus cloud systems in dynamics and microphysics, and their roles in both regional and global weather/climate.
• The Advanced Regional Prediction System (ARPS) and its data analysis/assimilation system are used for the real-time supporting forecasts (see the website: http://asd-www.larc.nasa.gov/model/crystal) and for this 4D data reanalysis/assimilation.

**Data**

• Surface observations: Hourly METARs, including the cloud reports
• Upper-level soundings: NWS/PARSL/Mible radiosondes and Dropsondes
• Satellite observations: GOES-8 IR and visible imagery data
• Radar data: WSR-88D (NEXRAD) Level II reflectivity

**Motivation**

• Reflectivity mosaics provide more complete depictions of convective storm structure than products from single radars.
• The mosaic gridded data can be more easily combined with information from additional data sources (e.g., satellite, model analyses and forecast fields).

**Multi-radar mosaic methodology**

• Multiple radar observations are blended using a weighted average scheme.
• The weight given to a radar observation is dependant on the distance between the radar and the observation.

**Future Work**

• To make use of satellite-derived cloud properties, to provide more detailed cloud information for data assimilation.
• To attempt 1-km resolution with more frequently assimilation-cycling (30 min or 15 min).
• To validate the assimilation data with the extensive experiment measurements.
• To conduct the cloud-radiation interaction physics for the assimilation system, to produce the radiative properties.

**Acknowledgment.** This work is supported by the NASA CRYSTAL-FACE project. The supercomputing resource is provided by NASA Center for Computational Sciences (NCCS).