# The performance of microphysical parameterization schemes in hurricane environments

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# Goals and objectives

- **Perform high-resolution simulations of tropical cyclones using sophisticated microphysical parameterization schemes**

- **Develop techniques for comparing model results with airborne microphysical probe and radar data**

- **Identify possible biases and sources of uncertainty in the parameterizations**

- **Implement improvements in schemes to improve simulations of hydrometeor distributions, vertical motions, latent heating patterns, and storm intensity**

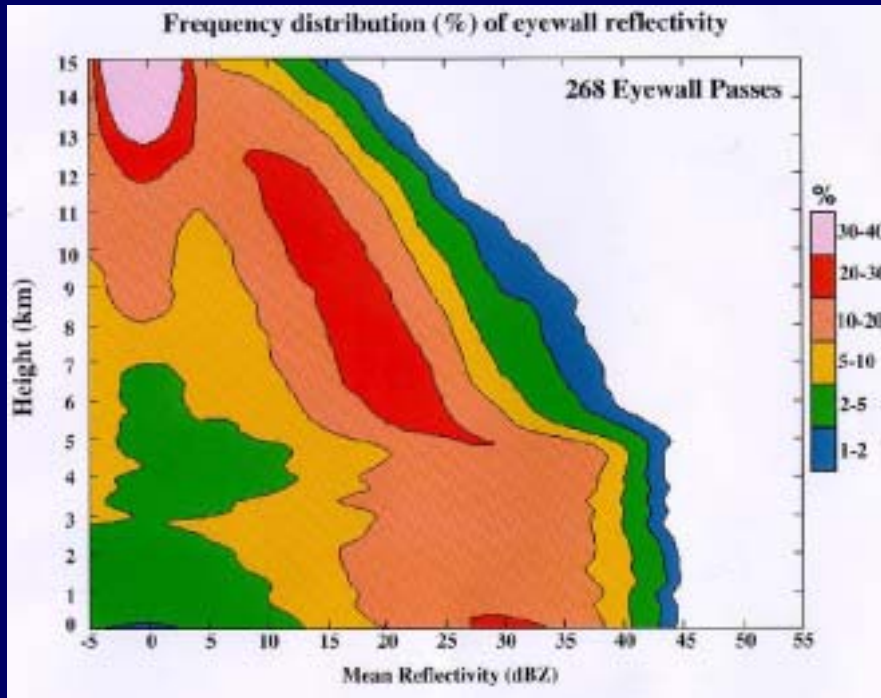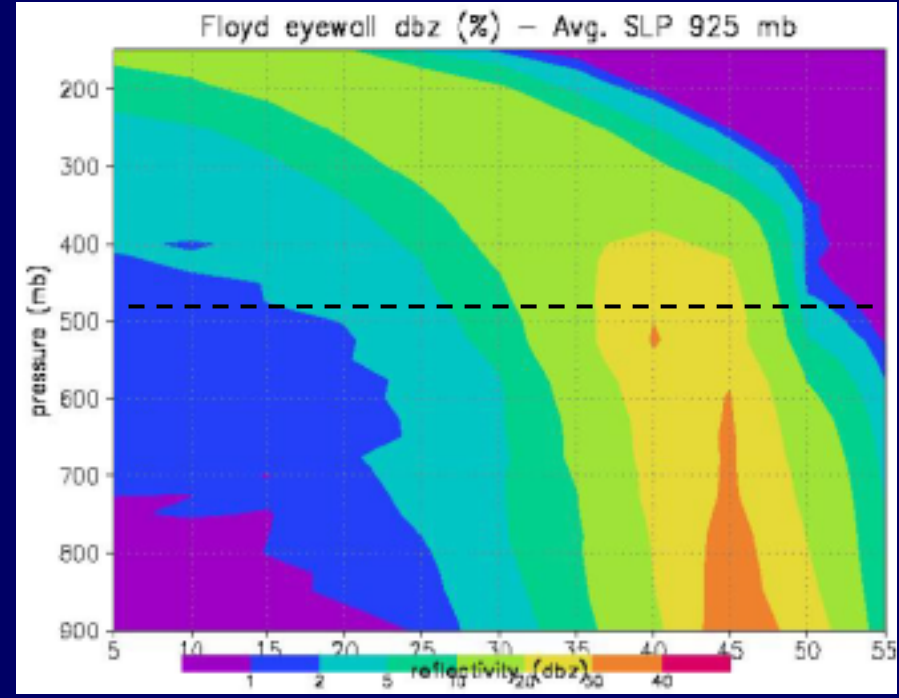# CFADs of vertical velocity

**eyewall**
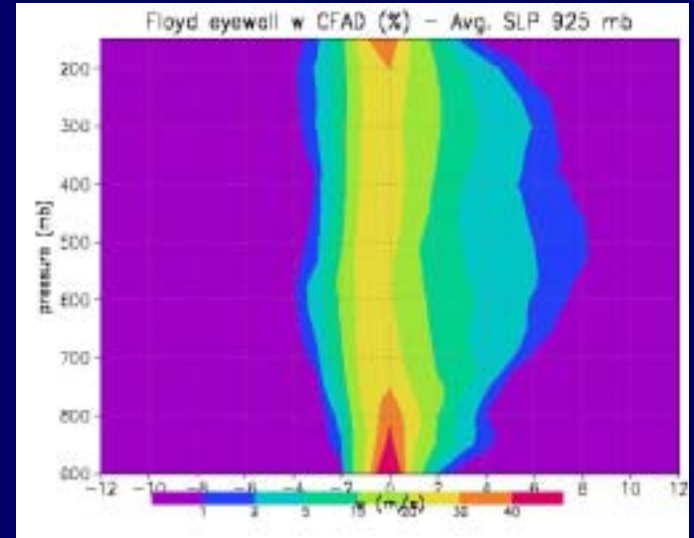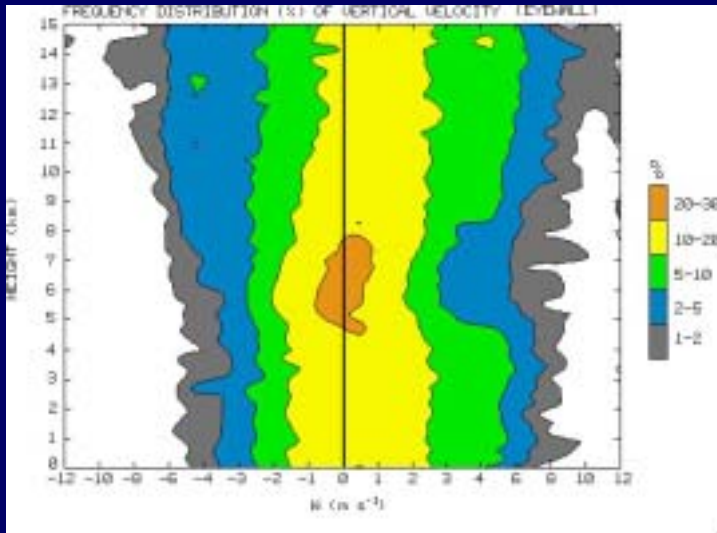
**stratiform**
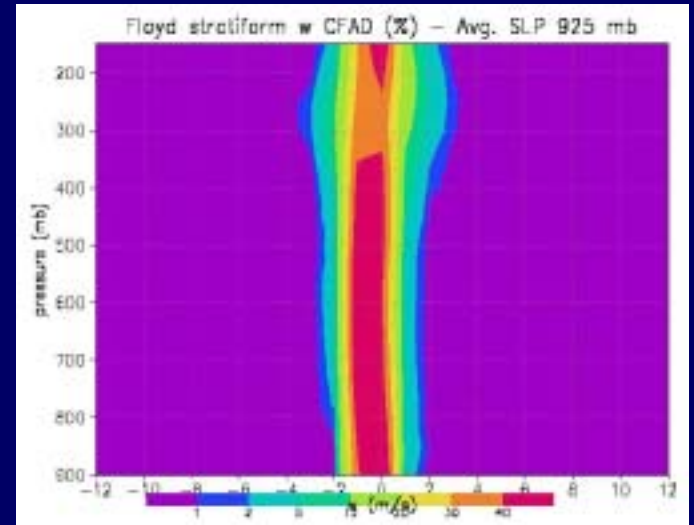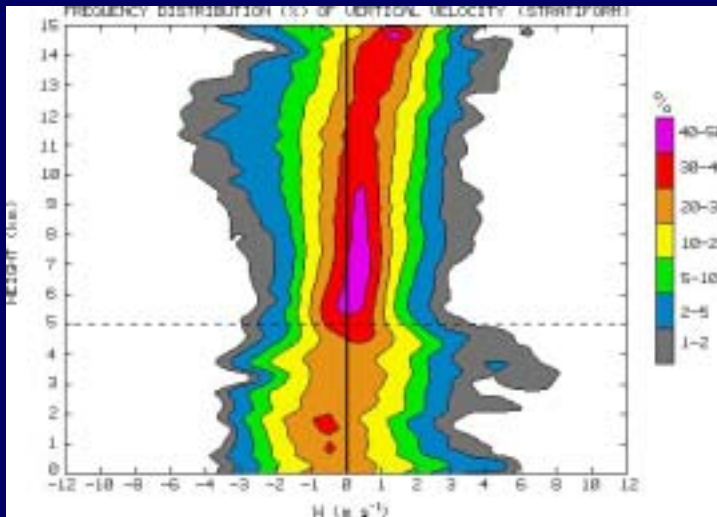
**Multi-case radar**

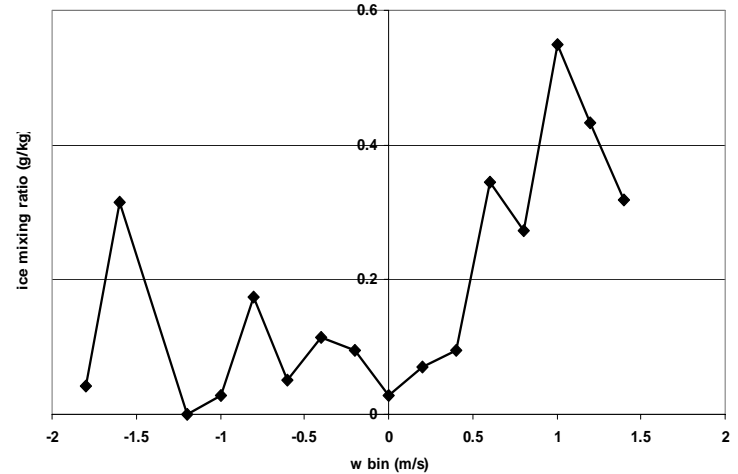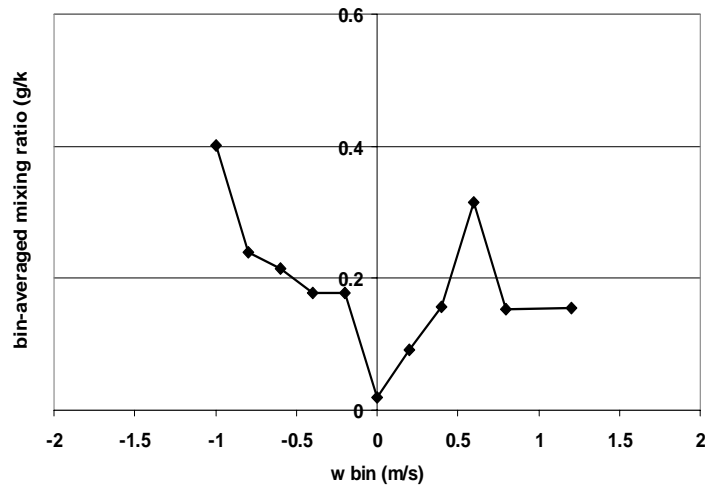**Floyd simulation**

# CFADs of reflectivity
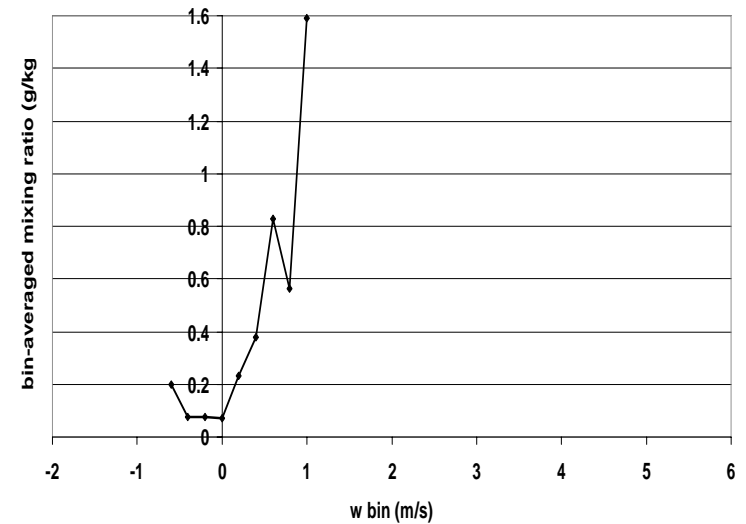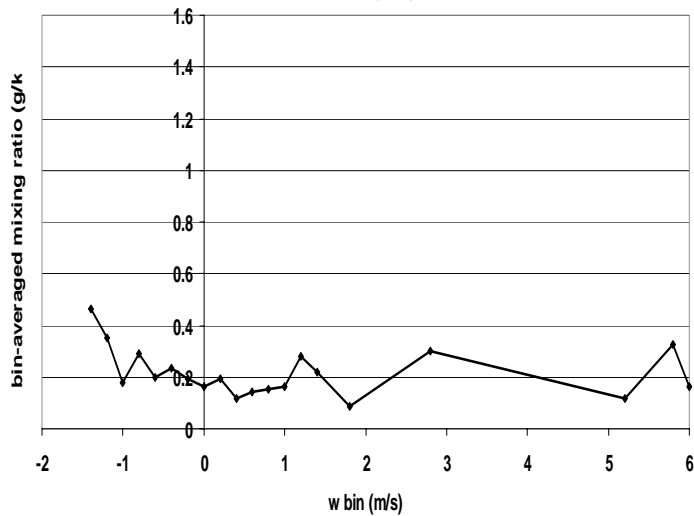


**Multi-case radar**



**Floyd simulation**

# Correlations of hydrometeors and vertical motion for Bonnie



**300 hPa**

**650 hPa**

**PMS probe**

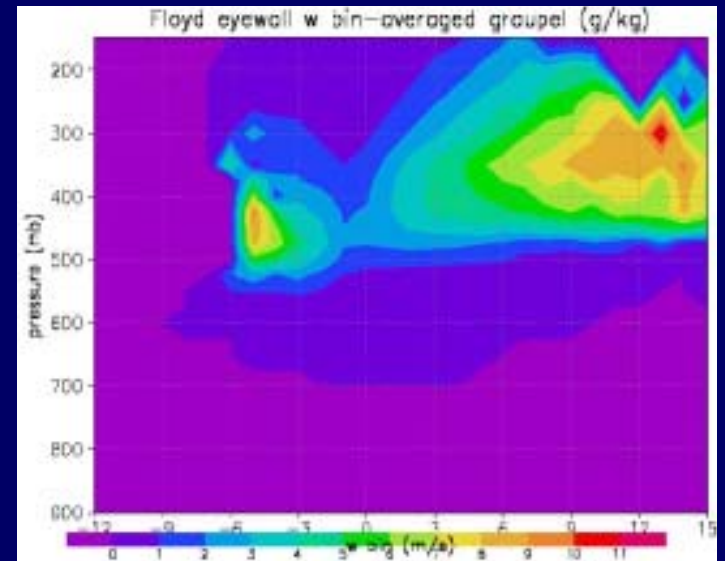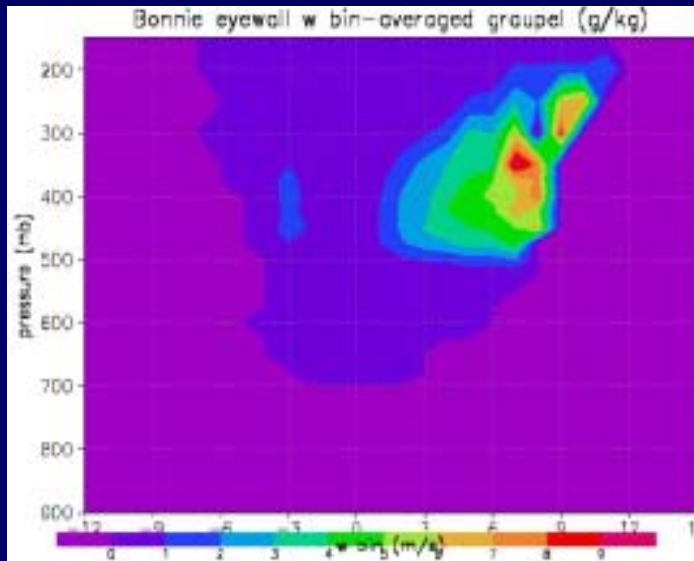**model**

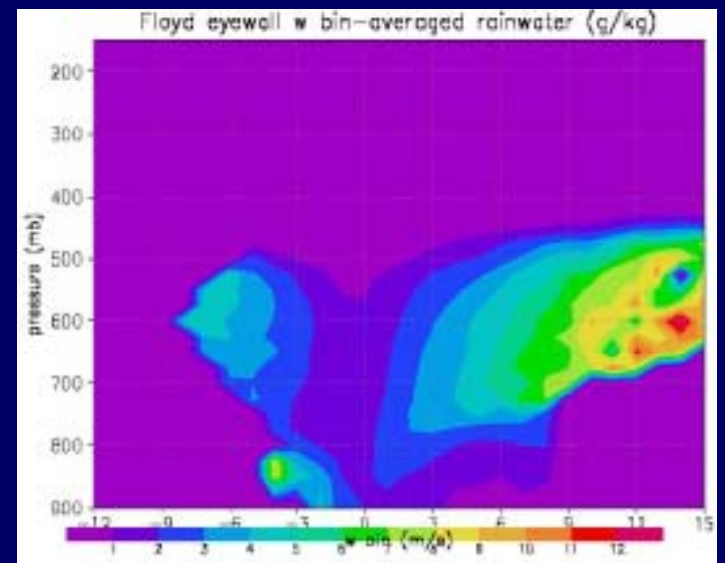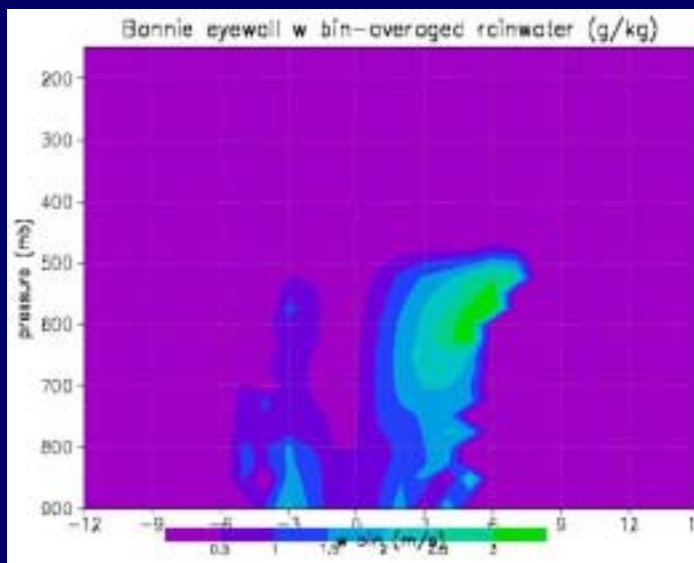# Profiles of simulated eyewall hydrometeor and vertical motion correlations

**graupel**

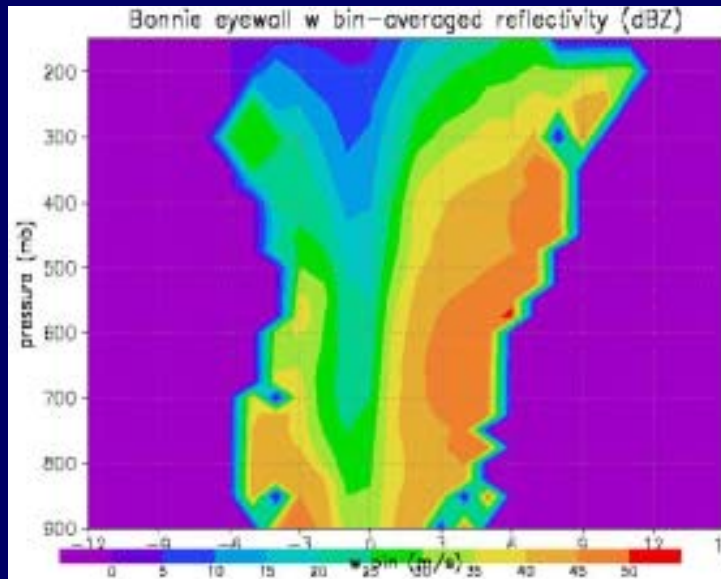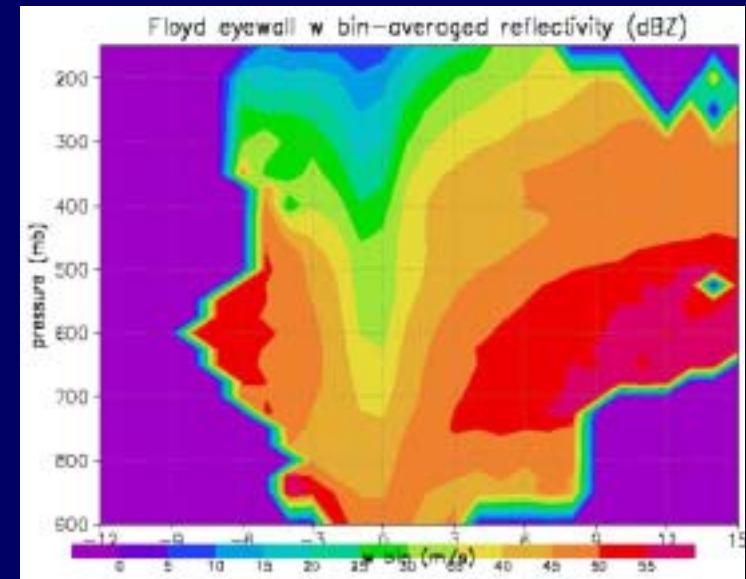**rainwater**

**Bonnie**

**Floyd**

# Profiles of simulated eyewall reflectivity and vertical motion correlations

**reflectivity**



**Bonnie**

**Floyd**

# Future work

- **Perform simulations of additional cases (e.g., Humberto, Lili) to broaden spectrum of storm structures, increase robustness of statistics**

- **Calculate correlations of vertical motion and reflectivity from vertical incidence radar data of multiple cases, compare with simulation statistics**

- **Use high-temporal resolution output (e.g., 2-4 minute) to evaluate production/conversion terms in scheme and calculate heat and water budgets for comparisons with budgets calculated from radar and probe data**