The Tropical Warm Pool-International Cloud Experiment (TWP-ICE) took place in Darwin, Australia in early 2006 in order to study the relationship between deep convection and its associated anvil and cirrus cloud. C-POL, BMRC’s scanning 5-cm wavelength (C-band) polarimetric/Doppler radar, provided 3-D observations over the field campaign region. This study employs C-POL reflectivity measurements within a 120 km radius of the radar and with a 0 dBZ minimum threshold, allowing analysis of the horizontal and vertical structure of precipitation and thick anvil. TWP-ICE experienced three distinct regimes: a wet monsoon (active convection in northwesterly flow), a dry monsoon (suppressed convection in very strong westerly flow), and a break period (continental convection in easterly flow). We estimate the latent and radiative heating profiles associated with precipitating convection and thick anvil observed during each of these regimes using a statistical method in order to provide a first approximation of the separate components of diabatic heating of cloud systems that occur in the Australian monsoon.

**INTRODUCTION**

**PRELIMINARY RADIATIVE HEATING ESTIMATES**

- **C-POL cross sections and idealized RH profiles**
  - Ice anvil
  - Mixed (base < 6 km) anvil
  - Stratiform rain

- **Inputs to calculation**
  - Ice anvil extent
  - Mixed anvil extent
  - Stratiform rain extent

- **Radiative heating time series**
  - Wet monsoon
  - Dry monsoon
  - Break period

- **Outputs to calculation**
  - Shallow convective rain
  - Deep convective rain
  - Stratiform rain

- **Conclusions**
  - The average latent and radiative heating profiles for each regime are strongly related to the amount and area coverage of rain and thick cloud produced by varying types of convection:
    - Wet monsoon had the strongest, most top heavy latent (> 20 K d⁻¹) and radiative (~1.5 K d⁻¹) heating because of the prevalence of MCSs that produce large amounts of stratiform rain and cloud.
    - Deep convection and anvil production were suppressed during the dry monsoon, making the latent and radiative heating profiles bottom heavy and smaller in magnitude (e.g., 5 and ~1 K d⁻¹).
    - Deep land convection during the break period caused a mid-level heating peak of 5 K d⁻¹ and preferentially formed upper level ice anvil and thus more radiative heating (~0.5 K d⁻¹) above 11 km.
    - Future work will refine the input heating profiles and apply the results to satellite radar observations.