

CAMEX-5 Science Rationale

Need more scientific certainty in the remote sensing of the 3 phases of water (general overarching question)

- Water Moisture - see R. Ferrare's questions
- QPE - in relation to large scale environment (Da-Lin Z)
- Microphysics - multiple wavelength radar; upward/downward looking
- Can key uncertainties in parameterized microphysics be removed through the better understanding of remotely sensed microphysical quantities.
- Potential for icing at temperatures of -40C and below in hurricanes. This topic is scientifically interesting and has not been solved. There are also operational issues: if we are to fly a UAV, or the WB57 into hurricanes, particularly the eyewall, icing conditions could be troublesome at best (A. Heymsfield).

Genesis of Hurricane Rationale

Genesis & Hurricane Intensity - is the driver for improving forecasts. Numerical models need good observational data. The hook to USWRP

- High res numerical models really need better humidity. Drives the convection.
- Models can now handle convection much better than the past
- Measurements can be used to initialize and also validate models

Obs need to be in core and synoptic environment

More rationale

- Need vertical profiles microphysical obs at -5 to -15 deg C layer (Greg McF)
 - Liquid and Ice Water content
 - Fall speed
 - Mass
- Extend to melting layer for the radiometric qualities
- Need to consider the upper level ice content (M.Biggerstaff)
- Study the potential for icing at temperatures of -40C and below in hurricanes. This topic is scientifically interesting and has not been solved. There are also operational issues: if we are to fly a UAV, or the WB57 into hurricanes, particularly the eyewall, icing conditions could be troublesome at best (A.Heymfield from e-mail 25Nov02)

- Target of opportunity - inland flooding (MBig)
- Coordination with CBLAST? Da-Lin Z sees benefits for the models
- Need a strong reason
- CBLAST/HRD is limited to 40m/s in the clear - will not be in the eyewall.
- CBLAST starts summer 2003. CBLAST-2 could be in either 2004 or 2005.

Counter arguments (CBLAST and CAMEX-5)

- HRD may be strapped resources to coordinating CBLAST and CAMEX-5
- Not critical that CBLAST be coupled at this time
- Frank Marks will have to work with P. Black to see if there are CBLAST benefits to CAMEX-5. What is the common goal between the two experiments?

Coordination with CRYSTAL

- CAMEX-5 NRA
 - 2004 planning team based upon successful proposals?
 - 2005 experiment - funding for full team?
 - Team with CRYSTAL - sequentially happen by teaming
 - Need adequate resources to satisfy competing objectives
 - A single NRA for both with complementary objectives (e.g., CRYSTAL does clouds; CAMEX does precip. CAMEX-4 missed obs clouds in Humberto)
- Synergy and overlap with other experiments can enhance argument at HQ