NIP Outline

1. Statement of problem
   1. Typical hurricane problem motivation
   2. See NPP proposal for this
2. Background of proposed work
   1. Why latent heat?
   2. Why isn’t what we have now good enough?
      1. Mention how new retrievals align well with GPM
   3. What is my contribution to this problem through proposal?
3. Methodology and procedure
   1. How does one compute latent heating?
      1. Determine structure by computing saturation
      2. Determine magnitude by computing heating rates
   2. Computation of heating requires these inputs
      1. Water content parameters
      2. Three components of wind over 3D/4D space
   3. Introduce two radars (IWRAP and HIWRAP)
      1. Explain how we can do better at water content parameters
      2. Explain the design of new wind retrieval from these radars
         1. Theoretical study to document feasibility and errors
         2. Application to real data cases
   4. Numerical modeling component with new heating estimates
      1. Simulation of GRIP or HS3 storm using new retrievals
4. Expected results and significance
   1. Large improvements in the retrieval of latent heating
      1. Motivation/Calibration/Validation for GPM
   2. New algorithm for retrieving 3D wind from conically scanning airborne radar including error estimation
   3. Demonstrate improvements in numerical modeling of selected storm using new latent heat retrievals.
5. Education/Outreach Plan
   1. Align with GPM activities?
   2. Work with GSFC visitor center to develop a program on Global Hawks/Hurricanes/Latent Heating for their “Science on a Sphere” production.