

## **MR3252: Tropical Meteorology**

Paper Summary for Schumacher et al. (2004). Please answer the following questions with as much detail as possible. Your answers may be in paragraph form or list form as appropriate.

1. What were the authors' primary research questions and/or hypotheses?
2. What motivated the authors to conduct this study?
3. How did the authors execute this research? What data and models did they use? How did they use these data and models? In other words, what was the experimental design?
4. What are some potential key limitations in this study, including those that were explicitly mentioned in the article?

5. What were the article's central conclusions? How did they relate to the primary research questions and/or hypotheses? (i.e., If possible, match a conclusions or set of conclusions to each research questions and/or hypothesis.) In your answer, include at a minimum details about how global distributions of convective and stratiform heating in the tropics impact the global circulation.
  
6. What are some examples of regions where the stratiform heating profile might not be an appropriate assumption even where the stratiform rain fraction is high? Why?
  
7. What are the three different types of latent heating profiles used in the paper? Describe their vertical structure? What percentage of each yields a modeled circulation that most closely matches reanalysis?
  
8. Is radiative heating or latent heating more important in deep convective regions? What about in cirrus anvil cloud regions with little precipitation? For both questions, why?