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William R. Boos* (william.boos@yale.edu), PO Box 208109, New Haven, CT 06520. *Towards a theory for where rain falls over tropical continents*. Preliminary report.

Despite decades of research, controls on the location, intensity, and variability of precipitation in the tropics are poorly understood. This is particularly true for tropical continental regions, which are home to developing nations and vulnerable agricultural economies. This talk will review the distribution of precipitation over tropical continents and present recent progress toward an understanding of the mechanisms controlling that distribution. Focus will be given to a theoretical framework in which nonlinear, planetary-scale circulations are thermodynamically coupled with the entropy of near-surface air by atmospheric moist convection; this framework allows assessment of the effects of ocean evaporation, topography, and land surface properties on tropical precipitation. Subseasonal variations in precipitation will also be examined, with emphasis on possible interaction between synoptic vortices and planetary-scale monsoon flow. Promising directions for improving our understanding and predictions of tropical continental rainfall will be discussed. (Received December 18, 2010)