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Hydrology and Earth System Sciences Discussions

Interactive comment on "Comment on "Biotic pump of atmospheric moisture as driver of the hydrological cycle on land" by A. M. Makarieva and V. G. Gorshkov, Hydrol. Earth Syst. Sci., 11, 1013–1033, 2007" *by* A. G. C. A. Meesters et al.

Anonymous Referee #1

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I agree with dr. Gorshkov and dr. Nobre that the there is an important disagreement between the classical understanding of the issue and the new theory presented by MG2007. The main point of discussion is whether or not the removal of water vapor molecules by condensation will cause a sustained drop in the bulk air pressure. While the classical school points to a re-establishment of the bulk hydrostatic equilibrium (bulk equilibrium is re-established by a related imbalance in the dry air components), the new biotic pump theory (BPT) claims that hydrostatic equilibrium is, in fact, never fully restored (thus continuous removal of water vapor molecules indeed creates a

sustained drop in the bulk air pressure). This has been lively debated in the present interactive discussion and, clearly, is not going to be solved in the timeframe prior to the publication of the DP.

Challenging old paradigms is of great value to the development of science and the BPT proposed by MG2007 is sound and certainly worth testing. The present DP presents a well written physical criticism to the BPT, in view of the classical theory, and it certainly recommended for publication.

Indeed, this has been a lively and fruitful discussion and I am also looking forward to the following publications on this issue.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 401, 2009.