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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Does the Budyko curve reflect a maximum power state of hydrological systems? A backward analysis" *by* M. Westhoff et al.

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We would like to thank Referee 2 for his/her very positive comments.

To shed light on the difference between maximum power principle and maximum entropy production we can say the following: For the example of two heat reservoirs, power is given as the heat flux times the normalized temperature difference, which follows directly from the first and second laws of thermodynamics (as explained in the paper). In hydrological settings, power is often generated by water fluxes and is determined by the product of the mass flux and the potential difference

$P = \partial M/\partial t(\mu_{high} - \mu_{low})$. It seems that several authors simply divided this equation by the absolute temperature and called it entropy production. Note, that in isothermal conditions (which are often assumed in these cases) maximizing power is mathematically the same as maximizing entropy production. We will shortly explain this in the revised manuscript.

On behalf of all authors,

Martijn Westhoff

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