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Interactive comment on "Technical note: rectifying systematic underestimation of the specific energy required to evaporate water into the atmosphere" *by* Andrew S. Kowalski

Anonymous Referee #1

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Because the author has agreed to withdraw the paper, there seems little benefit or need for me to comment. Nonetheless, as a reviewer I have been asked to do so. Dr Petty's point about the work done by the expansion of a gas during evaporation being part of the enthalpy of vaporization is correct.

The enthalpy of vaporization, L, represents a change in the enthalpy of the system, ΔH, and all the thermodynamics texts that I am familiar with state that the first law of thermodynamics during an evaporative process is expressed as $L = \Delta H = \Delta U + p\Delta V$, where ΔU represents the change in internal energy of the system and $p\Delta V$ is the work done by expansion. Consequently, the author's premise – as stated in the first two

sentences of his Abstract: "Not all of the specific energy consumed when evaporating water into the atmosphere (λ) is due to the latent heat of vaporization (L). What L represents is the specific energy necessary to overcome affinities among liquid water molecules, neglecting the specific work done against atmospheric pressure (p) when water expands in volume (V) from liquid to gas (pV work)." – is false. I would not recommend this paper for publication.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-195, 2018.