

Comment on hess-2022-134

Anonymous Referee #1

Referee comment on "Technical note: Do different projections matter for the Budyko framework?" by Remko C. Nijzink and Stanislaus J. Schymanski, Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-134-RC1>, 2022

This is a good manuscript, appropriate for a technical note. Your historical description is unprecise: since you chose to start with an historical perspective, your history should not be approximate!

- All the Budyko framework starts with Oldekop's work (1911), if you want to get convinced by yourself, the original publication of Oldekop is available as a supplementary material of one of our papers : Andréassian et al. (2016). This is not a secret, Budyko cites widely the work of Oldekop as his source of inspiration. Recently, Zhang and Brutsaert (2021) even suggested to rename the « Budyko framework » into the « Oldekop framework » ;
- From the point of view of the graphical representation, there were originally two concurrent representations : that of Turc (1954) and that of Budyko (1948). Nobody seems to have noticed this difference, and as far as we know the paper by Andréassian et al. (2016) is the first to mention it and to present both representations side by side. Other authors are now using this distinction (see e.g. Moussa & Lhomme, 2016 ; Porporato, 2022). Note that we failed to explain clearly this distinction in our 2012 paper (Andréassian & Perrin, 2012)... shame on us ;
- As far as I know, the most complete history of the Budyko-type formulas (Turc-Mezentsev and Tixeront-Fu) has been published as an appendix in Andréassian & Sari (2019) ;
- line 10: this is inexact. This formula was proposed independently by Turc (1954) in France and Mezentsev (1955) in the Soviet Union. This is why we most often name it « Turc-Mezentsev ».

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