

HESS submission by Roco et al

This work uses a simple 1D advective fog model based on various assumptions for a given budget equation. It is claimed that using satellite observations, model results and observations from MWR and adiabatic method are comparable, and they are very close to each other for annual representation. The work claims results can also be used for climatic fog research.

Based on my review, there are several errors existing in their work.

- This starts with equations and follows up with results. For example, mass balance equation is wrong, and assumptions are not presented or mentioned properly. What are they?
- Introduction is given in a large paragraph that doesn't focus on fog physics/dynamics etc at all. There are several works on marine fog (Gultepe et al 2021 BLM; 2019 Marine fog review; Fernando et al 2021) that are not mentioned. Characteristics of LWC, Nd, and DSD are provided in these works.
- Fog device for LWC is being used since 2006 (Gultepe et al BAMS and others).
- Where is the importance of Nd in the model? Without Nd, how do you get accurate LWC? What is physically missing here? What is the role of Nd in LWC?
- See for budget equations given for cirrus clouds in PAAG 1990s Gultepe et al where steady state assumption is assumed to solve horizontal and vertical advections. In addition, what role turbulence, radiation, and vertical advection play a role? What happened to these terms?
- Fig. 7 suggests that there are huge differences between observed and model simulations per month, how can annual values get closer so much? Something is wrong.
- How do you use satellite observations is not clear, how do you get fog LWC/LWP or coverage, no method is given properly
- Apply these results for climate is very much simplification, this should be taken out.
- Conclusions; needs to be collected for a few bullets and explained based on the text, not clearly explained properly.
- Appendix also has severe issues without providing assumptions.

Overall, I can't accept this paper as scientifically meaningful and it needs lots of work to be published.