

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2022-350

Anonymous Referee #1

Referee comment on "Investigating the performance of Genetic Particle Filter in snow data assimilation across snow climates" by Yuanhong You et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-350-RC1>, 2022

The topic addressed is within the scope of HESS. The manuscript is generally well organized and results are clearly presented. This manuscript investigated the potential of GPF used as a snow data assimilation scheme across different snow climates, the results presented in this manuscript will help develop new data assimilation scheme and improve the simulation accuracy of land surface model that leads to improve weather and climate prediction. In my opinion, this manuscript could be accepted for publication in HESS after the following comments are addressed.

Comments:

- Line 106: "Above studies" may need some recent references.
- Line 245: "The number of particles was set to 100" have been expressed in line 225, I suggest deleting one.
- Line 250: the variance scaling factor of the temperature was set to 2.0, why this value was chosen, 3.0 or other value can be used here?
- Line 259: What does the "SD" is refer to? Do you mean SD is the abbreviation of snow depth?
- The abstract should provide some numerical values from the performance metrics of the results.
- Line 236: Except for the air temperature and precipitation can be perturbed, whether other meteorological forcing variable can be perturbed, such as relative humidity and wind speed? As far as I know, the wind speed has great impact on the distribution of snow.
- The English writing has to be polished.