

Geosci. Model Dev. Discuss., referee comment RC1
<https://doi.org/10.5194/gmd-2022-24-RC1>, 2022
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Comment on gmd-2022-24

Anonymous Referee #1

Referee comment on "Regional coupled surface–subsurface hydrological model fitting based on a spatially distributed minimalist reduction of frequency domain discharge data" by Nicolas Flipo et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-24-RC1>, 2022

Line 63

(ii) instead of (iii)

Line 86

mHm is more an hydrological, rathe than LSM, better cite CLM, used by Kollet who is cited before.

Line 161

Please add "The following" before expression (2) because I was looking for a previous expression.

Figure 2 and lines around 156

I wonder what velocity is for almost 200 km (between Auxerre and Paris) in about 5 hours, 40 km/h? I think that a more detailed discussion is necessary regarding the concept of travel, transfer and concentration time in light of the many works in the last years. Especially if we also deal with matter and quality issues. Between the de Marsily blueprint of 1978 and now, a lot of work has been done.

The thesis of Golaz-Cavazzi and the paper in WRR of the first author is a bit too short basis.

Line 178

No words are spent for explaining how AET is computed.

Much later from figure 5 I guess AET is estimated as a fitting parameter with MCMC, but it has to be described much before, when main fluxes are described.

Line 184

Also regarding vadose zone, inherently nonlinear, the use of the Nash model has to be discussed more in detail with the relevant literature. The two parameters can adjust even a wrong model ...

Line 225

The interpretation of hydrological time series how is dealt with Fourier transforms? There are citations, but some description inside the paper could be helpful.

Line 239

Beside rainfall, is there any snowfall?

Line 249

Streamflow gauging, better specify it

Line 364

Total instead of total

Line 520

The comparison with papers not belonging to the group is restricted to paragraph 5.2,
More comparisons are needed.

Concluding my review I should like to see also some more description of the technique of
frequency domain reduction, I read all the paper waiting to have some more info.