



Interactive comment on “Multi-time scale data assimilation for atmosphere–ocean state estimates” by N. Steiger and G. Hakim

Anonymous Referee #1

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Authors claim that they developed a new data assimilation method; however, in their previous paper entitled "Assimilation of Time-Averaged Pseudoproxies for Climate Reconstruction" they have already used the same data assimilation method – Ensemble square-root Kalman filter - for time-averaged proxies. Here, section “Assimilation technique” is a copy-paste from “DA-based reconstruction” section of that paper. Moreover, the paper is poorly written with mistakes in mathematical terminology, for example in eq.2 matrix K is a product of two matrices, not a fraction, thus it is not correct to talk about numerator (l.18 p.3733); the prior and the posterior in data assimilation are probability distribution functions, thus the prior cannot “contain” a climate model variable (l.24 p.3732) and the posterior is not “the best estimate” (l.25 p.3732); $H(x_b)$ is not “the true value of the observations” (l.7 p.3733), since H is a forward operator from model space to observation space; “the prior-estimated observations” (l.20 p.3733) is

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a nonsense. These are just a few mistakes to name.

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