Ann. Geophys. Discuss.,
https://doi.org/10.5194/angeo-2020-31-SC1, 2020

Annales Geophysicae
Discussions

Interactive comment on "Vlasov simulation of electrons in the context of hybrid global models: A Vlasiator approach" *by* Markus Battarbee et al.

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Received and published: 19 June 2020

I have read this paper with much interest, since it promises to solve a long-standing problem in plasma simulations, namely the large separation of scales between ions and electrons. However, I have found this paper disappointing and completely unclear in the descriptions of the numerical algorithm. For me, the main question remains: How can you follow the electron VDF in a hybrid model? Either you have kinetic electrons or you don't.

This approach does not seem to follow neither the Darwin approximation, nor the neutral vlasov approach proposed in https://doi.org/10.1063/1.4907665

So how do they do it??

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