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Comment on angeo-2021-18

Anonymous Referee #2

Referee comment on "Electromotive force in the solar wind" by Yasuhito Narita, Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2021-18-RC2>, 2021

This paper is well written and covers an important topic. This (mini) review gives a clear indication that the study of the EMF in the solar wind is a valuable activity (and I agree with the author on this). The mean induction equation, with the alpha, beta and gamma split, is presented in equation (5). Shortly after, different expressions are given for alpha and beta, and then gamma. Although there are similarities between the expressions, the assumptions going into deriving those terms are very different (compare Krause and Radler with Yokoi). Some more information on the applicability of these models for the solar wind would be helpful. The author then highlights solar wind studies which use various forms of the EMF expression and discusses how effective they have been. What he has written is very clear.

I think there could be some more discussion on the physical importance of the alpha, beta and gamma effects for the solar wind. I don't think the appendix is necessary and could be replaced, without much loss. For example, the author includes magnetic helicity in the appendix, but this does not really feature in the main text.