Dear Authors,

Thank you for sending us your improved article and giving us the chance to consider your work. Your article was read by me and two external reviewers. We enjoyed reading your article and are pleased to make a provisional offer of publication if you are able to revise the paper to address the following additional comments of one of the reviewers:

Reviewer's comments to the revised version

The authors have added text in sections "4.1 Addressing some idealisations" and "4.3 Search for observational support" and made further minor changes. Disappointingly for me, none of the additions and modification seem to address the points that I had made in my first comment. In their reply the authors seem to admit that there are limitations to their approach, particularly that momentum is not conserved in their model, but then they provide a lengthy text which I have a hard time to understand in parts. The manuscript would greatly benefit, if limitations and assumptions were properly stated. These are:

1) Equations (3) and consequently (4) is only correct in the absence of any ionization/recombination. In the Earth's E region, where the model is supposed to be applicable, ionization and recombination are very significant terms on the continuity equation. The assumption of no ionization/recombination is still nowhere stated in the manuscript.

2) Momentum is not conserved by the model, because FACs are suppressed. The statement "...there is no requirement for FACs to be occurring on the boundaries of the very patch..." is not correct. The momentum balance could be established by magnetic stress as the first equation of my comment shows for the moving 1d interface. To get the magnetic field jump across sharp interfaces, local FACs are needed. FACs "occurring far outside the area of our study" do not help for the local momentum balance.

I had not suggested that the model is reworked to fix these limitations, only that they are properly exposed also to the reader.

Kindest regards

Yours cordially
Dalia Buresova