Referee 1:

>The revised paper addresses most of my concerns. I still find some of the arguments slightly subjective, but they are not completely wrong. The examined magnetosphere is some hybrid between Earth and Ganymede. It can be studied, of course, but its relevance to any real magnetosphere is unclear. The choice of parameters is guided by the available computational resources and the inefficiency of the numerical method, not by physics. It is not very clear what new insight is gained and how this can be a better approach than using semi-implicit scheme for Hall MHD or embedded PIC, for example. It does not look like GPUs by themselves can overcome the computational challenges of modeling a realistic magnetosphere (Earth or Mercury). Using optimal numerical schemes is more powerful than raw hardware speed.

>In any case, here are a few typos/statements to fix. Line numbers refer to the revised PDF file:
>3: it is unclear what the inflation factor is because there are three d_i values mentioned. It would be best to specify the factore explicitly:
"...artificially inflated by a factor of 70." I also note that d_i in the solar wind is not representative. There are regions with smaller d_i (sheath) and there are regions with larger d_i (most of the tail), as seen in the new Figure 3.

RESPONSE: Thank you for pointing out the vagueness. We have modified the abstract to explicitly mention the factor of 70 increase in di.

>5: smaller than Earth's. -->
smaller than Earth's compared to δ_i.
smaller than Earth's in units of δ_i.

RESPONSE: We have made this change.

>102: is the electron charge "e" negative? Usually "e" means the elementary
charge, and it is positive. But then the sign of the last term in (1)
would be wrong. If "e" is indeed negative, this needs to be clearly specified.
Maybe q_e is a better notation then.

RESPONSE: This was a typo, thank you for catching that. It should have been a (+) sign in front of the Hall term.

>Equations 3-4: Fix the notation: B_g -> B_0

RESPONSE: We have made this correction.

>127: across jump shocks -> across shocks across shock jumps (?)

RESPONSE: We have made this correction.

>136: Alfven (accent should be \'e not \`e)

RESPONSE: We have made this correction.

>150: "cc" is a rather casual notation, and it should be 1/cc anyways.
cm^{-3} is better.

RESPONSE: We have made this change.

>150 If L_0=R_E is given in km (not cm), why do you give the v_0 in cm/s?
The usual unit is km/s.

RESPONSE: We did the normalization in CGS units, but we had also wanted to use more human-readable units for some quantities (length, mass, etc.). As a compromise, we will give quantities in both the CGS units used for normalization and the more-commonly used units used in magnetosphere studies.

>151: if n_0=5/cc is the number density and rho_0 is the mass density, then
the mean molecular weight \mu should be 1 amu, not 3942.18 amu.

RESPONSE: We are not sure what you mean. Rho_0 = n_0 * mass of each ion. In order to have d_i = R_E, then the mass of each ion must be ~3942 amu. We realize that we have used \mu and ion mass interchangably in this paper, so we will change all mentions of \mu to m_i (ion mass) in order to be consistent with the definition of d_i presented in the paper.

>270: an universal -> a universal

RESPONSE: We have made this change.

Referee 2:

Methods and Codes
Line 91: the abbreviation of GPU has already been mentioned before, so we can use it here. CUDA itself is more of a language, although Nvidia provides multiple low-level libraries written in CUDA.

RESPONSE: Yes, CUDA is more like an API than a library. We have made these changes.

Line 150: the authors attempted to use Gauss units based on the choice of G and cm/s, etc. However, in that case why are the lengths still given in km? Maybe it would be more natural here to follow the most common units in magnetophere studies, e.g. km, nT, km/s.

RESPONSE: We did the normalization in CGS units, but we had also wanted to use more human-readable units for some quantities (length, mass, etc.). As a compromise, we will give quantities in both the CGS units used for normalization and the more-commonly used units used in magnetosphere studies.

Figure 1: it would be better to add \Delta before y too: Δx, Δy

RESPONSE: We have made this change.

Results and Discussion

Line 196: same argument as in Figure 1 caption

RESPONSE: We have added \Delta in front of y and z when discussing grid spacing.

Line 203-204: possible typos: based on the colors in Figure 4, ion → green and electron → blue?

RESPONSE: Yes, this is a typo. Thank you for catching that.

Figure 6: are the two plots on the left column scaled equally? The gray inner circle seems stretched in the y direction.

RESPONSE: We believe that adding the colorbar may have slightly shrunk the x-axis of the plot in the final rendering. Nevertheless, we believe the plot still functions as intended, showing the dipolarization evolution.

Figure 7: same argument as before for the Gauss units.

RESPONSE: We have modified the caption to include both Gauss and nT.

Conclusion

Line 284: there is an extra ">" sign.

RESPONSE: We have removed this extra sign.

List of changes in paper:

- All typos mentioned above have been fixed
- One sentence in abstract modified as per referee comments above
- Units in problem setup given in both CGS and other, more human-readable, units