Ann. Geophys. Discuss.,
https://doi.org/10.5194/angeo-2018-47-RC1, 2018
© Author(s) 2018. This work is distributed under
the Creative Commons Attribution 4.0 License.

Annales Geophysicae Discussions
Open Access
EGU

Interactive comment on "Contribution of patchy reconnection to the ion to electron temperature ratio in the Earth's magnetotail" *by* Chuxin Chen and Chih-Ping Wang

Anonymous Referee #1

Received and published: 30 June 2018

The paper presents a study that calculates Ti/Te ratio. The authors conclude that Ti/Te ratio would be preserved if reconnection only happens once. This conclusion is not supported, as outlined below. The biggest problem with the study is the methodology. The authors model reconnection by simply cutting the Tsyganenko magnetic field by half, ignoring the heating associated with reconnection. The authors claim that Ti/Te would be preserved if the magnetic field line is cut by half. Actually, given the methodology and assumptions, Ti/Te should still be preserved even when the reconnection happens more than once to the same field line. Can the authors show that using the same methodology, if reconnection happened more than once, Ti/Te would not be preserved? Why would the authors introduce reconnection? Is this necessary? Why not

Printer-friendly version

Discussion paper

just try the methodology without reconnection? The authors claim that the comparison with the observations (Figure 4) is good, but upon close examination, there are some differences. The authors need to discuss these differences. Tsyganenko model is a time independent model with no reconnection built in. How do the authors model the field line after the reconnection in Figure 2? Tsyganenko magnetic field does not cross the equatorial plane at Xhalf in Figure 2. How do the authors force the model to bend the field lines so that they reconnect at Xhalf and how would the authors know what the field line configuration would look like after the reconnection?

It is not clear if the formalism presented by the authors can handle reconnection.

Interactive comment on Ann. Geophys. Discuss., https://doi.org/10.5194/angeo-2018-47, 2018.

Printer-friendly version

Discussion paper

CC BY