

Interactive comment on “Mirror mode physics: Amplitude limit” by Rudolf A. Treumann and Wolfgang Baumjohann

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Received and published: 7 September 2019

The "Response" posted was meant to Rev 1.

Unfortunately it was incomplete when copying it in an doing Latex which erased everything after the % sign.

Here is the missed part:

better than 10% or so. The value of pairing is therefore less in the speculation on the susceptibility made in the last subsections than in the contribution of a perpendicular temperature/pressure anisotropy. This should drive other instabilities of various kind if possible in the mirror plasma. Those are in the first place electron mirror mode which have ultimately been observed again at much larger amplitude than quasilinear, but

also other waves Bernstein modes, whistlers (which have also been observed) etc. Maybe observation of these modes already proves the existence of electron pairs? It has not been checked ut should. Also in application to ions one could put forward similar arguments. The interesting point is in any case that once the quasilinear limit is reached which is in pressure balance as it simply heats the trapped component on the expense of the perpendicular anisotropy (whether electrons or ions) until pressure balance is achieved, the additional anisotropy of the pairs (electrons or ions) causes a pressure imbalanced depletion of the magnetic field which must be pressure compensated which happens mainly by sucking in additional cold nonbouncing plasma of small magnetic moment from the surrounding. If this is forbidden, then one would expect that additional heating would be produced, and this would eat up the perpendicular anisotropy caused by the pairs, putting them back into the plasma and restoring pressure balance. In this case existence of pairs would be an intermediate state which leads to large mirror amplitudes (applicable to both electrons and ions).

Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2019-86>, 2019.

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