

**ANSWER TO REFEREE 1
(ADDENDUM TO FIRST ANSWER)**

We thank the Referee for her/his interesting and encouraging comments. Here some new answers to her/his remarks which must be considered as an addendum to the first response already sent to the Referee on October 1st.

Title. We have taken into consideration the Referee remark. However, we have finally decided to keep our initial title since we want to put the accent on the question of "how building a realistic multi-fluid model of the magnetopause" rather than on the study of the magnetopause stability (and related mixing issues) resulting from a specific initialization. The simulation presented is just a first proof of a feasibility and, concerning the magnetopause stability, the study remains here preliminary. Nevertheless, we are open to consider new remarks, if needed.

Why not two electron populations?

We thank the referee for raising this point that we missed in the text. A new paragraph is now added in the Introduction.

Kinetic magnetopause models. We have re-organized the whole paragraph in the Introduction in order to better focus the argument.

Why fitting the data to build an equilibrium since we are not sure that the observations are those of an equilibrium? This is certainly a crucial- point. We have tried to discuss this point in a clearer way (see conclusion).

Minor points. All minor points reported by the referee have been fixed and we are grateful to the Referee for her/his suggestions.

It is a bit strange to cite a paper from 1998 (before the Cluster launch) to show that space plasma modelling has advanced during the Cluster era. In our opinion it is not so strange since a huge work has been done before the launch to prepare the analysis of the data. On the top of that we note that a first launch has failed before (1995).

In this region of space, one finds both particles of magnetospheric and magnetosheath origin. In phase space, however, these particles do not occupy the same regions. Anyway, there is no way to distinguish the origin of a particle either in real or in phase space.

As written here, equation 1a and 1b assume that only electrons and singly charged ions are present; this is too restrictive if one would like to include the magnetosheath alpha particles. The aim of the study is not to consider the role of the alpha particles, but the role of hot and cold protons. We have changed ions into protons at the beginning of Section 3.1.