

Reply to Referees' Comments

Let me thank the referees for their helpful and insightful comments on my paper. Here are my responses to their comments.

Referee 1

1. In Sect. 4.5, I have added a discussion of mode coupling. I have also given an argument that shows that the criterion $|\Delta_k|/(2m_k) \gg 1$ for an ideal response, and vice versa for a vacuum response, remains approximately true even in the presence of mode coupling.
2. In Sect. 5.9, I have added further discussion of the significance of the overlap of resistive layers close to the separatrix. I have also tried to show how the overlap combined with the fact that $|\Delta_k|/(2m_k) \sim \mathcal{O}(1)$ in the overlap region, lead to the conclusion that the response of the region is vacuum-like.
3. As to whether there is a causal relationship between the overlap and the weak layer response, I think that there is, because both effects are directly related to the enormously large magnetic shear close to the separatrix. If all of the plasma parameters stayed the same in the separatrix region, but the shear were $\mathcal{O}(1)$, then there would be no overlap of the layers, and the shielding response of the layers to the RMP would be very strong.
4. I have adjusted the JET parameters to be consistent with discharge 84800 ($B_0 = 2.0\text{ T}$ and $a = 0.9\text{ m}$).
5. I have added a table (Table 1) that shows how the width ϵ_c varies with the effective charge number, Z .

Referee 2

1. I have removed the specific values for ϵ_c from the Abstract.
2. I have removed the unnecessary “Introduction” sub-sections from Sects. 2, 3, 4, and 5.
3. In Sect. 2.1, I have changed “the coordinate system is uniquely defined” to “the straight-field-line coordinate system is uniquely defined”.
4. In Sect. 2.6, I have added further explanation for the derivation of Eq. (13).
5. In Sect. 2.6, I have also added some discussion as to why I think that the result $\alpha_+ > \alpha_-$ is generally true.
6. In Sect. 2.8, I have added a reference to derivation of the crucial induction equation, (22). The derivation itself is in Appendix A. (It took me a whole day to remember the derivation, so it clearly needs to appear explicitly in the paper.)
7. I have now stated that the term LCFS is “misleading”, rather than “inaccurate”.
8. I have replaced the term “marginally-stable” by “inertia-free”. The response of the equilibrium to a static RMP is governed by inertia-free ideal-MHD (except in the resistive layers) because the original equilibrium remains an equilibrium in the presence of the RMP. In other words, a static RMP does not cause the plasma to move Alfvénically.

9. In Sect. 4.1, I have added more discussion as to the significance of the terms appearing in Eqs. (48) and (49). I have also added more discussion of the terms appearing in the normalized layer equations to Sect. 5.4.
10. I have added an additional figure (Fig. 9) that shows explicitly that the ordering $(n s)^2 \gg |Q_e|, |Q_i|, |Q_E|, D, P_E, P_\varphi$ holds very well close to the separatrix.
11. I have changed the final comma to a full-stop in the final sentence.