Dear Steve,
We thank the two reviewers for their comments that have helped us to improve our manuscript. The corresponding changes are marked in blue.

> Reviewer: 1
> However, there is something quite fundamental that I don't
> understand about the authors' work. The issue is how to reconcile
> a growing eigenmode with a decaying linear average of the same mode.
> The eigenmodes are of the form exp{ lambda t} * B_0{x}, and so the mode
> grows or decays at the same rate, point wise, throughout the domain. The
> eigenvalue lambda can of course be complex, giving oscillatory behaviour,
> but overall if Re{lambda} > 0, then the mode grows everywhere. This fits
> with the authors' fig 1, showing that each component grows at the same
> rate. Taking a linear average of a growing mode should also grow at the
> same rate. This is confirmed in figure 2 by the average of Bx. However,
> on the same plot, they also that the average of By decays.

To address the referee's puzzle most effectively, we felt it best to show a sketch (our new Figure 3) highlighting the difference between two types of mean-field dynamos: the standard ones of alpha^2 and alpha-Omega type in which poloidal and toroidal (here Bx and By) fields reinforce each other, and those where each component is able to grow independently of one another. The negative turbulent diffusivity dynamo is one example, as was illustrated by Devlen et al (2013), and the time delay dynamo is another (Rheinhardt et al 2014).

> Can the authors please clarify what is going on here? Either it is a
> mistake, or there is a crucial piece of information that they need to
> include. If it is a mistake, then removing it doesn't alter the main
> thrust of the paper, and I think there is enough material remaining
> to be publishable. If it is correct, in addition to an explanation,
> it would be useful to include an analytic example of a mode that is
> everywhere growing at the same rate, but has a decaying average.

We recall that the unusual behavior of the latter class of dynamos was already mentioned in two places (top of page 4: ... with two components evolving independently ..., and bottom of page 10: ... very different from the more familiar alpha^2 and alpha-Omega dynamos ...).
We do appreciate, however, that the significance of these statements may easily be overlooked and that the newly added sketch will make a difference.

> Minor issues:
> Abstract, sentence 2 "They minimise the magnetic energy dissipation
> and the critical..." There are two quantities here: the dissipation and
> the critical Rm. Do you mean these are minimised separately or together?
> Please reword.

We have now clarified this, we have now inserted the word "equivalently".

> Introduction, page 2. Missing are references to other flows in
> the literature showing non-axisymmetric kinematic dynamo action with
> axisymmetric flows e.g. DUDLEY, M., & James, R. (1989). TIME-DEPENDENT
> KINEMATIC DYNAMOS WITH STATIONARY FLOWS. Proceedings of the Royal Society
> of London Series a-Mathematical Physical and Engineering Sciences,
> 425(1869), 407&M-^@M-^5429.

We have listed this now; see the top of page 2.

> Page 5, under equation 3.9 "Because each..." is not a sentence.

We have now replaced "Because" by "This is because".

> Page 5, above eqn 3.11. "For up to 83%" Is this rms difference?
> Please explain.

We have now clarified this and write on the bottom of page 5:
"For up to 83% of the total enstrophy, <\curlU^2>, ..."

> Page 5/6 Eqns 3.12 and 3.11 seem to be the same?

Yes, the second equation should have been removed. We have done this now.

> Section 4.2: please spell out the importance of eta + \tilde{eta} as
> the effective diffusivity. This is later crucial for the interpretation,
> but is never properly introduced.

We have now done this; see the penultimate sentence of Section 4.2.

> Discussion: other experiments should be mentioned e.g. DTS, Maryland
> etc. A recent review is Adams, M.M., Stone, D.R., Zimmerman, D.S. et
> al. Liquid sodium models of the Earth&M-^@M-^Ys core. Prog. in Earth and
> Planet. Sci. 2, 29 (2015) doi:10.1186/s40645-015-0058-1

We have now mentioned these two experiments along with this review;
see the second sentence of Section 8.

> Reviewer: 2
> Page 2, first 5 lines: The flow of the Ponomarenko dynamo is
> axisymmetric and has a rather low magnetic Reynolds number of about
> 17. An experimental verification has been done in Riga. So please
> change your introduction.

We have now mentioned the Ponomarenko dynamo and adapted the sentence correspondingly; see the top of page 2.

> Page 5: The relation between (3.6) and (3.7) is not clear. Please be
> more explicit.

On page 5, we have now added a sentence after Eq.(3.7) that the two sets of coordinates are related by
(\tilde{x},\tilde{y},\tilde{z})=(x, z +\pi/2, y-\pi/4).

> Page 5, after (3.10): you write that B&M-^@M-^YTTT has the same general
> representation as (3.9). Do you mean replacing the cosine by sine?

No, but we have now added a short description for clarity.

> Page 6: in (3.12) the same formula as (3.11) is repeated.
> Is it a mistake?

Yes, this was a mistake and we have now removed the second expression.

> Page 8, table 1: please use the same precision in the values of table 1
> as those in the body of the text, otherwise it makes comparisons hard to
> catch: for example 0.4301 in the text and 0.4031 in the table. Shouldn't
> the last two numbers for MNT be 0.014 and -0.048 instead of 0.14 and
> -0.48 ? In the caption maybe should you explain that eta corresponds to
> a case supercritical by about 15%.

We have done this now and write 0.403 instead of 0.4031. We have also corrected 1.14 and -0.48 to 0.014 and -0.048, respectively. Regarding the 15% supercritical case, we have now added "(sixth column)" for clarity.

> Page 9, section 5.1: you give a Willis' critical diffusivity which is
> different from the one given in table 1.

We have now corrected 0.4981 to 0.568.

> Page 9, section 5.1 end of the first paragraph you give lambda=0.050
> whereas it is 0.052 in table 1. Please be consistent.

In the text, we have now corrected 0.050 to 0.052.

> Page 10 last paragraph: the value of eta is again inconsistent with
> table1.

We have now replaced 0.0829 by 0.083 in three places (twice on page 11

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and once on page 17 in the caption of Fig.15).

> Page 12, line 3 of second paragraph: it should be x* instead of x.

This seems to be now the penultimate paragraph of Sect.5.2 on page 12.
We also made such a change in the second paragraph of Sect.5.1.

> Page 13, Figure 7 caption: you use kz instead of k.

We have corrected this now; it is now in Figure 8 on page 13.

> Page 13, Figure 7: What do the dotted curves stand for?

They represent approximate fits, as is now specified in the caption.

> Page 14 Figure 10: misprint in eta+gyy-0.

The is now corrected.
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