

Response to Reviewer 3's comments on the paper "Parametric resonance in the dynamics of an elliptic vortex in a periodically strained environment" by K.V. Koshel and E.A. Ryzhov.

We thank the reviewer for commenting on the manuscript. We have addressed the issues raised by the reviewer. The following is the point-by-point responses to the reviewer's list of questions:

*Reviewer's comments:*

*This work considers the stability for an elliptic vortex subjected to an external straining flow, examining different dynamic regimes depending on the external flow parameters. This is a novel work, very much of interest to and worthy of publication in this journal. I find no problem technically with the paper, only minor typos, as well as some sentences which should be changed to provide more clarity.*

(1) page 1, Abstract, line 2: missing full stop after the word "regimes".

(2) page 1, line 15: Suggest changing wording to "Such models are usually highly nonlinear making it possible to gain insight into many phenomena that are difficult to predict within a geophysical setting"

(3) page 1, line 24: Suggest changing wording to "In the case of a stationary deformation, the elliptical vortex is able to perform..."

(4) page 2, line 3: Suggest to remove redundant phrase "not performing any motion", or else add comma , before the word not.

(5) page 3, line 9: Change to "these equations allow for parametric instability."

(6) page 3, line 11: Remove words "type of the"

**Author's Response: Thank you very much for pointing these shortcomings. All has been corrected.**

(7) page 3, line 14: Unclear what is the intended meaning of the line "provident time- dependent strain and rotation rates...", please clarify

**Should be "given time-dependent ....."**

(8) page 3, line 25: Typo, remove repeated line "The homoclinic separatrix...."

(9) page 4, line 13: change word "on" to "of"

(10) page 5, line 17: Typo, change "parametrici" to "parametric"

(11) page 6, line 6: add word "over" after prevail

(12) page 6, line 7: change "realizes" to "is realized"

(13) page 6, line 7: change "very" to "immediate"

(14) page 8, line 8: Typo, change "stead" to "steady"

**All has been corrected.**

**We again thank the reviewer for the recommendations.**

Best wishes,

Eugene A. Ryzhov, Konstantin V. Koshel