

Interactive comment on “Parametric resonance in the dynamics of an elliptic vortex in a periodically strained environment” by Konstantin V. Koshel and Eugene A. Ryzhov

Anonymous Referee #2

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The short paper proposes an exploration of the effect of an oscillating external flow on a two-dimensional elliptical vortex patch. In particular the effects of nonlinear suppression of the parametric instability growth on a couple of examples.

I believe the paper is interesting and overall well-written. I believe also that most of the results are original and can be accepted for publication with minor corrections (mostly typographical errors).

Minor points:

1) P5 l.10. 'omitting the fast-oscillating term ...' Why can the author do this? Does this term average to 0? Are the authors making a fast-time/slow-time separation?

C1

2) Fig 3 and 4 should be more explained in the text, and caption should provide more information:

Questions which come to mind immediately:

i) In fig 3 and 4: are $\epsilon=0.15$ and $\gamma = 0.02$ from fig 1 still used? The same question goes for fig 2 in fact.

ii) Fig 3,4 a) Can the authors add a short sentence provides the details on how are in practice they obtained their Poincaré sections?

iii) Fig 3,4 b) What is the exact starting point of the trajectories used to illustrate the generic behaviour?

iv) It is unclear visually whether the trajectory in Fig 4b keeps spiralling outward for long times.

Minor points, typographical errors:

o) Abstract: add a full stop at the end of the first sentence.

a) p3, l1 "x-axis" -> "\$x\$-axis"

b) p3, eqn (3) Ω seems undefined in the present paper. The author should not expect the reader to read Bayly et al (1996) to understand symbols.

c) p5, l7 What is τ . It is a rescaled time t or just t ?

d) p5, 16. The sentence unclear. Maybe rephrase as "...if the argument in the right-handed exponential function.." Then, on the next line, typo : "parametri" -> "parametric"

e) p6. l9 & l16. Be more specific when referring to "primary" and "secondary" zones. What is meant? I guess primary is the zone around $\nu = 0.6$ and the secondary the one around $\nu = 0.3$ but it is unclear.

f). p7 caption of figure 4: "The same as in fig. 3" (not 4).

C2

g) p8. l10 typo " nonlnear" -> "nonlinear".

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