Review of "On modulational instability in a system of jets, waves and eddies off California" by Ivanov et al. (2014)

June 29, 2014

The authors have answered and considered most of the reviewers' comments. The manuscript has been much improved. But the authors still need to better discuss the modulational instability in $(M-mode, \omega)$ space. Here at the request of the authors, I clarify one of my related questions. My previous question was:

The M-modes approach has advantages in dealing with non-regular domains, but also imposes difficulty in interpreting results. Majority of the existing theories about the modulation instability are derived in Fourier space. The formulation of resonance in an $(M-mode, \omega)$ *space is not common and needs clarification. For example, the authors used the mode index of the M-modes as an equivalence of Fourier wavenumber (P106L20). Readers would benefit from a reference or some discussions on the validity.*

The authors' response is:

We do not see any problem with interpretation of modulational instability in (M-mode, ω) space. M-modes are the same Fourier modes but generalized on non-rectangular areas only. We published more than five papers where these modes were used. Your comments about non-commonly of M-modes seem to be surprise for us. If possible, could you please give us a more specific criticism?

I apologize if my question was not specific. My question was simple: can you provide the wave amplitude equation for a quartet in the $(M-mode, \omega)$ space? I am not criticizing the usage of M-mode in describing natural variabilities, but only concerning the direct application of the M-modes, the eigenmodes of the Laplacian operator in an irregular domain with assumed boundary conditions, to the modulational instability theory. This kind of formulation sets the foundation of the whole study so that it ought to be better presented.

I am surprised by the fact that my comment "*The formulation of (modulational) resonance in an* $(M-mode, \omega)$ *space is not common*" was a surprise to the authors.