

The paper represents an attempt to build an ideologically straightforward, and at the same time efficient theory for modulationally unstable unidirectional deep water gravity wave trains, which takes into account the effect of a slowly varying current. The system of equations for a wave quartet, taking into account the current, is the main outcome of the paper. The dynamics of the system is briefly analyzed for a few interesting situations, and then applied to compare with available laboratory measurements. The benefit of the approach is employed to describe an interesting physical effect, when modulationally unstable waves may propagate behind the blocking point through breaking of a short-scale component. The comparison of the model simulations and the experimental data exhibits rather good agreement.

The interest to the considered problem is evident, and the existing scientific background which may be found in the literature is substantial. The related studies are rather well discussed in the extensive (though still incomplete) introductory part.

In my opinion the paper may be published in the journal after some issues get clarified. In general, I agree with the comments of the first referee. To my mind, the theoretical approach is not very much rigorous, but may be accepted. The set of assumptions is in fact very selective, though seems to be physically reasonable.

Issues to be addressed.

1. The obtained system of equations (20) in the limit of a zero (or constant) current should tend to the classic theory for a resonant wave quartet (e.g. Mei et al, Theory and Applications of Ocean Surface Waves. World Scientific, 2009, §14.7). Was this limit verified?

2. Let us focus on the stationary boundary problem (Sec. 3). The interacting waves are assumed to be in resonance along entire Ox , though their local wavenumbers vary according to (19) (and some nonlinear corrections to σ_j). Therefore the waves naturally get detuned, what should destroy the description (the modal approach is applied in Shrira & Slunyaev, J. Fluid Mech., 738, 65-104 (2014) to overpass a similar obstacle). Am I mistaken?

3. The authors claim that the present theory and the linear solution for the carrier envelope on variable current give different estimations for the wave maximum (Fig.1b). At the same time, the maxima are significantly closer in Fig.1c. It is interesting to know how significant is the difference between the developed theory and the analysis of the modulational instability of the current-modified nonlinear Schrodinger equation (derived in the cited work by Onorato et al.). The comparison between the theories and laboratory measurements (Fig. 2) does not lead to a decisive conclusion, which theory is better. In this respect the paper by C. van Duin (J. Fluid Mech., 399, 237-249, 1999) may be relevant.

4. The variation of sideband wavenumbers due to nonlinearity (according to authors' description, – gaps on the corresponding curves in Fig. 1f) – are of order $O(1)$ of the carrier wavenumber. At the same time, the value of k_1 is just slightly altered. Does this mean that the situation is **too much** nonlinear? Do the dependences look more realistic for smaller waves?

5. I am puzzled by the curves in Fig. 1a,b,c,e.

5.1) Two spatial scales seem to exist: of the nonlinearity, and of the current. According to authors' choice they are of same orders, but may be aliquant. Why there is always an integer number of oscillations under the current profile? The solutions seem to be perfectly symmetric. Why?

5.2) Do the authors have an idea, why the location of the current maximum (cf. Fig. 1b and Fig. 1c) results in such big difference between the solutions?

5.3) In the course of modulational growth the superharmonic attains larger amplitude than the subharmonic. This contradicts the classical result, which is opposite (i.e. Tanaka, Wave Motion, 12, 559-568, 1990, or the recent study by Slunyaev & Shrira, J. Fluid Mech., 735, 203-248, 2013).

Minor remarks.

- Capture to Fig. 2. What is “SD”? The spectral widths for panels (a) and (b) are given in different manners, what may lead to confusion.
- The value of the breaking parameter γ is not specified.