Comments on the paper
"Asymptotes of the nonlinear transfer and wave spectrum
in the frame of the kinetic equation solution"
by Polnikov, Vladislav; Qiao, Fangli; Teng, Yong

The previous version of the paper has been reviewed for *Journal of Fluid Mechanics* 3 months ago. The titles of these two versions differ by the only word (swell -> wave). The present review largely follows my report for the *JFM*.

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The authors results are based on numerical solutions of the Hasselmann equation (HE) for the case of spatially homogeneous random wave field with different initial conditions. Authors are making an attempt to relate features of the initial conditions with asymptotic behavior of the collision integral (nonlinear transfer term NLT in words of authors). The goal of searching for such link and the results themselves are clear from the paper abstract and text.

Authors used the algorithm by Polnikov. This algorithm has never been properly described, tested and compared with alternative numerical approaches. Numerous inconsistencies in the problem statement do not allow qualifying the results as confident. Quality of Excel-made graphics and the corresponding figure captions are unconvincing. The quality of presentation is poor: grammar, improper use of terms, numerous typos and corruption of names.

In addition to the previous report to *JFM* one can provide more examples of poor quality of the paper:

In Abstract

L18 "asymptote of nonlinear energy transfer becomes negative". "Negative asymptote" sounds, at least, as a slang;

P2L3 – $(k_x,k_y)=(k,\theta)$ meaningless (again, a mathematical slang?);

P2L9 – Authors used kernels (elements in words of authors) derived by Crawford et al. (1980). As shown by Krasitskii (1994) these kernels are not correct (discussion in page 2 of Krasitskii), they make the Zakharov equations non-Hamiltonian and, hence, do not lead to conservation laws for wave action, energy (formal) and momentum (formal). Thus, further authors' speculations on integrals of motion for eq.1 make no sense;

P3L19-20 – "Finally, only two methods have survived …". It is quite questionable declaration. The method of V.I. Lavrenov is always in use (see works of M. Benoit). The new method of Geogjaev & Zakharov (2017) has been recently presented (authors corrupt the first author name throughout the text);

P3L27 – "Polnikov (1989) have showed". The algorithm of Polnikov is incorrect (see above) and "the conservation balance for the integral values" has not been properly investigated in the cited paper;

P3L32 – The self-similarity of solutions for the kinetic equation has not been demonstrated by Polnikov (1990, see this paper) because of rather short duration of

simulations. Approximation of the spectral peak frequency decay in this paper by the power law $t^{-0.1}$ (eq.9) contradicts to the analytical result $t^{-1/11}$ (e.g. Badulin et al. 2005);

P4L25 – Reference Badulin & Zakharov (2017) is absent in the reference list;

Eq12a – The limit of wave length in simulations about 3 cm (51 rad/s) looks irrelevant (see below the review for JFM).

The list of notes can be far continued.

In the cover letter authors claim:

Competing interests

"As far as this work competes with the previous results by the Prof. Zakharov's group (e.g., Badulin S, Pushkarev A, Geodjaev V,, Korotkevich A.) and numerous his coauthors (e.g, Resio D, L'vov, Fal'kovich and others, in references), this could make a conflict of interests in the publication process. The same can be said for Van Vledder G, and Perrie W, who use the competing WRT-5 method for calculating KI."

In the reviewer opinion, the declaration contradicts the journal *Competing interests policy* and looks as an attempt to avoid professional discussion of the paper by excluding the majority of experts in wind-wave studies.

The paper is below any professional standards and cannot be published in *Nonlinear Processes in Geophysics*.

Report for JFM, May 4, 2018

Comments on the paper
"Asymptotes of the nonlinear transfer and the swell spectrum in the frame of the kinetic equation"
by Polnikov, Vladislav; Qiao, Fangli; Teng, Yong

The paper is below any professional standards and cannot be published in *Journal of Fluid Mechanics*. The radical opinion of the reviewer can be summarized in three "i"s illustrated by examples. More comments are given in the attached file.

i) **Ignorance.** Example: Lines 8-10, page 6. *"We used two versions of the numerical algorithm, corresponding to the exact conservation of either wave energy E or wave-action N".*
Conservation laws are inherent properties of the equation under study and cannot be regarded or disregarded by *"versions of the numerical algorithm";*

ii) **Incompetence.** Example: Eq. 7a, page 5. Frequency ω=80 rad/s corresponds to waves shorter than 2 cm, i.e. to capillary waves that cannot be related to the problem of sea swell (see the manuscript title);

iii) **Irreverence.** The paper is full of disrespectful comments to results of other authors, improper citations. Some authors' names in the list of references are corrupted (e.g. Garganier instead of Gagnaire, Geojaev instead of Geogjaev). Authors do not cite the recent paper "Ocean swell within the kinetic equation for water waves" by Sergei I. Badulin and Vladimir E. Zakharov Nonlin. Processes Geophys., 24, 237–253, 2017 https://doi.org/10.5194/npg-24-237-2017 (please, compare with the manuscript title). They mention other papers of Prof. Zakharov's group as "*a large series of papers by Zakharov and co-authors"* without explicit citations.

The paper cannot be published in *Journal of Fluid Mechanics.*