Nonlinear Processes
in Geophysics
Discussions

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Interactive
comment

Interactive comment on "Asymptotes of the nonlinear transfer and wave spectrum in the frame of the kinetic equation solution" *by* Vladislav G. Polnikov et al.

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The letter of reply on the comments by Dr. S. Badulin "round 2" on manuscript "Asymptotes of the nonlinear transfer and wave spectrum in the frame of the kinetic equation solution" by Vladislav G. Polnikov, Fangli Qiao and Yong Teng

We are thankful to Dr. Badulin for his interest to our paper. But it seems that he did not read the manuscript to the end. It is seen from his comments which do not touch the main results and conclusions of the paper. By the way, the same remark we have made in our first letter of reply to his first letter of comments.

In the second round of comments, Dr. Badulin is continuing to state (P2L9) that using "the Crawford et al. (1980) non-symmetric kernels makes the corresponding version of the kinetic equation (KE) non-conservative". This is the statement which is absolutely not furnished with proofs.

Indeed, in (Polnikov 1989) we have compared our calculations with ones by Masuda(1980) and found very good correspondence. Moreover, in the discussed text it is said that for fast falling spectra (with $n \geq 5$), the conservation of the total wave energy is fulfilled very well. Thus, this point is closed.

For fast falling spectra, the power-falling tail for NL-transfer is well expressed (see Fig. 1b). Herewith, on page 10, lines 11-15, we state that (citation from our text) "5) When spectrum-decay parameter n approaches to 4, the relative intensity of the NLT-tail decreases radically (Fig. 2a); and when $n \leq 4$, the decay-features of NLT begin to depend significantly on the spectrum parameters: γ, a, relative frequency ω/ωp (Fig. 2b), and on the limits of the computing grid in units of ω/ωp . This feature is due to the slow convergence of the KI in such a case (see other numerical details in Polnikov and Uma, 2014)." Just this case was taken by Dr. Badulin to criticize our work. It is the wrong choice.

Dr. Badulin simply did not take into account that Fig. 2b is the explicit demonstration of the radical transition of the form for function $NL(\omega)$, when parameter n approaches to 4. This is why the power-like tail is not expressed at the first step of the KE solution.

Note again, at the long-term stage of evolutions, the power-like tail of $NL(\omega)$ is well displayed and has form $Nl(\omega) \sim - \omega\hat{}(-4.15 \pm 0.05)$ (Eq. 22). For a more cogency, we put the additional Fig. (1+) in the supplement to this reply. The figures of such a kind were not inserted into the text due to their triviality. The proper results for parameter p are presented in Table 2, with the hope that a reader will trust to the authors.

Evidently, that Dr. Badulin has done the improper choice for making his decision about our work (in both comments). It needs to go on and discuss, for example, Table 2, Figs.

6, and 7 (first of all), among others results.

Thus, we are urged to repeat that "the discussion in essence" is still ahead, when somebody will repeat our calculations and obtain the same or other results.

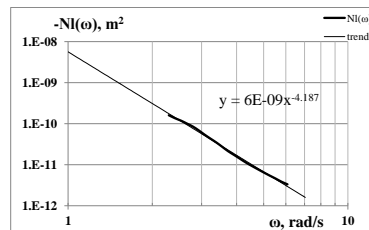Hope that publication of our paper will stimulate such research.

On behalf of the co- authors, Dr. Vladislav Polnikov. 11.09.2018

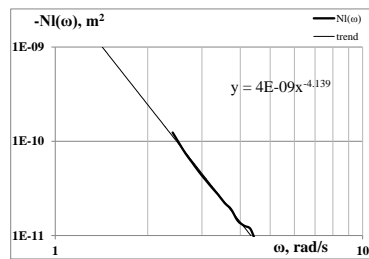Interactive comment on Nonlin. Processes Geophys. Discuss., https://doi.org/10.5194/npg-2018-35, 2018.

(a)

(b)

Fig. 1+. Asymptote of NL(ω) at the long-term stage of evolution ($t>10^6$ s) .
Bold line is NL(ω); thin line is asymptote.
(a) Run 2 from Table 2 (equation : $y = 6E\text{-}09x^{-4.187}$); (b) Run 8 from Table 2 ($y = 4E\text{-}09x^{-4.139}$)

Fig. 1.