

Author response to referee comments on EGUSPHERE-2022-831 "Extension of Ekman (1905) wind-driven transport theory to the  $\beta$ -plane" by N. Paldor and L. Friedland

Referee #1

We were happy to read to referee's recommendation to publish our paper.

The suggested references are now included in the revised version (see lines 24-25)

Referee #2

We agree with the reviewer's general remarks and were happy to read that the reviewer "... enjoyed reading the mathematical development in section 3, 'Analysis.'".

As for the two main comments:

- A. We accepted this point. In the revised version the numerical solutions will follow the analysis. In accordance with this change, old Fig. 3 is split into figures: 3 for the y-dynamics and 4 for the x-dynamics.
- B. We agree – the meaning of  $y_0$  is much subtler (and intriguing) on the  $\beta$ -plane than on the f-plane. In the revised version the numerical calculations will be initiated at the fixed point  $y_0=0$  (and  $V_0 \neq 0$ ). As expected – our preliminary calculations show that the change of initial conditions has negligible effect on the results.

Specific comments:

Thank you for your careful reading. All typos and miss-worded phrases will be corrected in the revised version.