

Interactive comment on “Waveguidability of idealized midlatitude jets and the limitations of ray tracing theory” by Volkmar Wirth

Olivia Romppainen-Martius (Referee)

olivia.martius@giub.unibe.ch

Received and published: 5 February 2020

This paper presents a systematic analysis of the sensitivity of Rossby wave propagation to the strength and width of the extratropical jet stream. A simple but convincing set of idealized simulations are run to explore the role of turning latitudes and PV gradients for wave propagability. It is a joy to read this well organized and clear paper. Two theoretical concepts are introduced and compared against the model results. The limitations of the model simulations are discussed. I recommend acceptance after minor revisions.

Minor points: L2 which → that L28 suggest to replace what aspect with which properties L35 This is an aspect of the QR theory that is also unclear to me. In my understand-

Printer-friendly version

Discussion paper



ing an interference of the wave with itself is not needed for QR. Rather the interference with the forced signal is crucial. However, if the wave is circumpolar the interference should be constructive. See also: <https://link.springer.com/article/10.1007/s40641-019-00150-x> L50 This statement is unclear for me. L54ff This is slightly confusing since one scale is in the meridional direction and the other scale in the longitudinal direction. L91 why is v_f set to zero? L90ff A schematic depiction of the forcing could help the reader. L137 delete however L158 void \rightarrow devoid L168 could you add the equation of motion for the convenience of the reader? L203 weak \rightarrow small L217 ON the other hand \rightarrow in contrast L220 which \rightarrow that L227 turning latitudes L292 On the other hand \rightarrow in contrast L310 How independent are the jet width and the jet strength? Can these two parameters be varied completely independently? L345 behavior L405 This can also be interpreted from a PV anomaly point of view. The far field effect of PV anomalies would allow waves to cross areas of weaker gradients and “reinitiate” a wave on a downstream waveguide. L424 maybe add the equation for the group velocity.

Interactive comment on Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2020-3>, 2020.

Printer-friendly version

Discussion paper

