

Review of Second Revision of Doicu et al., “A numerical model for solving the linearized gravity-wave equations by a multilayer method”

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The authors have made sufficient changes in response to my previous comments, but there are a few more minor changes which are needed.

The terminology KL and KU following eq. (59) will be unfamiliar to some readers, so perhaps it should be omitted. Otherwise, a reference should be given.

Just before eq. (82), it says “Assuming that the lower boundary conditions can be expressed ...”. This was added in response to one of my comments, but I find it unclear. Presumably, this has to do with the problem of large dissipative vertical wavenumbers in the inviscid region. If so, then more context should be added.

Lines 643-645: It says “These phase shifts can be attributed to differences in the real part of the gravity-wave eigenvalue, or equivalently, in the vertical wavenumber of the ascending gravity-wave mode.” It should say the imaginary part of the eigenvalue or the real part of the vertical wavenumber.

Figure 2: The sharp changes in the third panel (differences between roots in log scale for the general model) around 105 km and 175 km suggest that the imaginary frequency shift may not be sufficient. To investigate this, the authors should look at the real parts of the ascending and descending vertical wavenumbers to verify that they are continuous. It may be that the roots cross each other, meaning that they trade places at the aforementioned altitudes. Imaginary frequency shifting is supposed to prevent this. Further investigation could be left for future work.

Lines 690-705: Please mention here that the solutions are not expected to be affected by changes in δ if the LC condition holds and cite Knight et al. (2022, following eq. (2.58)) which discusses this.

Figure 9: What are the y-axis units in Figure 9? If they are relative errors, then this should be stated in the figure labels or caption. Also, how are they normalized?

Lines 933-937. Where it refers to Section 2.2 and eq. (3.35), it should be made clear that this refers to Knight et al. (2024). This can be done by saying “their Section 2.2” and “their eq. (3.35)”.