

Interactive comment on “The response of super pressure balloons to gravity wave motions” by R. A. Vincent and A. Hertzog

Anonymous Referee #3

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A very interesting article discussing an important new measurement technique. I do not wish to comment on the derivations of the presented equations, since this has been done in detail by the other referees.

My main problem with this paper is that the successive simplifications and derivations of the equations are based on a comparison with a numerical model. This numerical model in turn is only discussed very briefly in section 3.1, without giving any detail and without giving references to previous work. The only factual information that is given is that a fourth order Runge-Kutta method was used.

I feel that the numerical model is the base of this work, since it was used to make choices in the derivation of the equations of the analytic model. Therefore the imple-

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mentation of the numerical model should be discussed in much more detail. What choices were made for the discrete time step and the driving function w' ? What effect does the choice for discretisation have on the higher frequencies found by the model? Can they be calculated reliably and to which order? At what frequency are they cut-off? The bottom panel in figure 1 seems extremely clean to me. There is no sign at all of numerical artefacts. Does this imply that an extremely small time step was used? And if so, how does this affect the stability of the outcome of this explicit numerical integration scheme, which may decrease for very small time steps? Has this been studied? In the caption of figure 1 the transient start-up effect of the numerical system is mentioned very briefly. Please describe in more detail what effect this is, how much simulation time is needed to let it fade (and what threshold was used to determine this).

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