

Interactive comment on “Satellite observations of middle atmosphere gravity wave activity and dissipation during recent stratospheric warmings” by Manfred Ern et al.

Manfred Ern et al.

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Dear Referee #1,

Thank you very much for thoroughly reading our manuscript and for raising several questions in order to strengthen the discussion of results. We will add some discussion of these questions in the revised manuscript. Please find below a few preliminary comments.

a) about stratospheric sources

Of course, it is not possible to decide from our observations alone whether there are gravity wave sources in the stratosphere. Gravity waves that are observed at 30km can

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have their sources at much lower altitudes. In particular, the momentum flux distribution in Fig.7c6 (weak vertical gradients) is likely not caused by stratospheric sources since the weakest or even negative vertical gradients are observed at even higher altitudes (around 55-60km). Therefore meridional propagation of gravity waves is the more likely reason for the weak vertical gradients.

b) about insensitivity of potential drag to the background flow

One of the points mentioned is an apparent mismatch between the time scales of the momentum flux recoveries in our study compared with Fig.5c in Hitchcock and Shepherd (2013). In fact, the time scales of momentum flux recovery are quite comparable; please note that Hitchcock and Shepherd (2013) use a time axis with zero at the central date of the major SSW, while in our figures $t=0$ is at 1 January 00:00 UT.

This discussion will be included in the revised manuscript. In addition, we will address the other questions raised in the review.

Again, thank you very much for your effort!

Sincerely, Manfred Ern

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