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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Rayleigh lidar observation of a warm stratopause over a tropical site, Gadanki (13.5° N; 79.2° E)" *by* V. Sivakumar et al.

Anonymous Referee #1

Received and published: 10 June 2004

Overal quality:

The discussion paper is in my opinion reasonably well written and contains useful data intercomparisons. It explores and discusses the warming features in a succinct and effective manner. It provides new data well analyzed from additional previously unreported regions, which is a welcome addition to our knowledge of phenomena such as Major SSw's.

Specific issues: The height discrepancy between HALOE and the lidar in identifying the location of the warming is worthy of more thought and comment. Is this merely a matter of resolution?

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The paper is short and hence is unable to explore some aspects which clearly need consideration. In particular as the authors comment the evidence of a quadrupole moment signal and its significance.

Modelling examination of the observed features is clearly an interesting aspect the research community should consider.

The delay between the High latitude peak warming and that observed at the tropical site is of the order of 20 days. The authors state 'shortly after'. Could the authors expand on the timing issue within their planetary wave re-focussing argument?

Technical issues: a few minor technical issues need to be addressed.

-) the word/typo 'interms' is two words "in terms"

-) Page 2979 - " Meanwhile, it is also evident from the PV-field that the air-mass "intrusion" originates from the southern tropical zone (low and negative PV) and has moved northward ...."

-) Page 2980 - "and deviations there from, with all.." - "PW breaking can be recognized..."

-) Page 2977 - grow not grows

-) Page 2978 - "As well, the comprehensive study ,(Fritts, 1984), of middle atmospheric gravity wave activity has shown that the wave activity maximizes in winter at high latitudes and in equinoxes at low latitudes"

= orginal sentence rather garbled and unreadable, I hope this modification expresses your intended meaning.

-) Page 2978 - "may not be as significant in the..."

-) Figure 5 is a busy plot and as such needs alot of care. The vectors seem small to me and I would hope the figure could be enhanced for clarity. For example why not alter

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the width like Figure 4?

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 2973, 2004.

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