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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 #2

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This paper talks about a warming at the stratopause at Gadanki observed by the lidar and supported by HALOE observations and ECMWF analysis. The experimental data is convincing that there was a warming at the stratopause occurred at Gadanki, and the authors tried to relate this event as a Sudden Stratospheric Warming (SSW) occurred at the low latitudes.

I have a few general comments. My main concern is that SSW has been defined in literatures. The SSW occurs usually at high latitudes with a +30°C warming at the stratopause, and with the associated events including coolings in the upper mesosphere and troposphere. There is also a lowering of stratopause height by about 10 km. All these associated events are related with the planetary wave activities. In this

paper there is no discussions made about these coolings and stratopause height lowering. Actually Fig. 2 shows there was a warming at 65 km in either the lidar or HALOE data. Therefore, I think the authors need to clarify these questions.

Secondly, the authors showed that a SSW initially occurred in the high latitudes, and then spread to the low latitudes. It is interesting if such warming was observed in the mid latitudes supported by HALOE observations. Actually this might be a global event.

Technically, I think Figs. 1 and 2 can be improved further. The temperature uncertainties are not too clear because the temperature scales are large. Maybe temperature uncertainties at each height level can be stated in the text or more clearly presented. The paper may be publishable if these questions can be answered.

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