

Interactive comment on “Solar 27-day signatures in standard phase height measurements above central Europe” by Christian von Savigny et al.

Anonymous Referee #2

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The authors use Kühlungsborn phase height measurements to analyse the response of the D region / upper mesosphere to the 27 day solar cycle. They find a negative correlation as expected, seasonal and solar cycle effects, and, unexpectedly, a stronger effect during solar minimum than during solar maximum. There is a lag of few days between solar variability and (negative) phase height. They also use CMAM geopotential heights to gain some insight into possible atmospheric effects on the phase height variability. The results are new and interesting, the analysis is made with care, and I recommend publication of the paper.

I found section 4.3.2 a bit unsatisfactorily. The authors present regression of phase heights and CMAM geopotential height maps at lag zero. Why was this lag chosen? Is there a lag between CMAM geopotential heights near the reflection point and the

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solar flux? The authors propose NO transport for being responsible for the negative correlation of phase heights and geopotential heights. Since NO or winds are not shown, this is only qualitative. However, given this effect is working, phase heights should decrease as long as transport anomalies are southward, and a delay between geopotential heights and phase heights could be compared with this analysis, which could be based on gradient wind anomalies, or simply visual inspection of CMAM maps at different lag.

Minor comments

L 85: I do not see a 27-day peak in Figure 3, but enhanced power also at about 23 days.

L 95: The data analysis is the same than in section 3.1, but the whole time series is used, right?

L 106: Have there been limitations concerning the solar flux maxima, e.g., amplitude, or distance between them?

L 109: replace "N" by "N = 584".

L 156: I do not understand, phase height and LYA have different units and amplitudes, what is the meaning of the ratio?

Fig. 6: Axis labels for LYA and solar flux should be added.

L 160: I see the negative correlation for the summer of 1985, but not for 1986.

L 205: Maybe mention that the correlation between F10.7 and LYA does not hold for solar minimum.

L 266: Insert a period after the URL.

Caption of Fig. 11: The bottom part refers to 0.01 hPa.

L 289: middle panel -> lower part of the upper panel.

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L 312: Days -> days

L 502: Add an URL

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