

## ***Interactive comment on “Stratospheric observations of noctilucent clouds: a new approach in studying large-scale mesospheric dynamics” by Peter Dalin et al.***

### **Anonymous Referee #2**

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Review of “Stratospheric observations of noctilucent clouds: a new approach in studying large-scale mesospheric dynamics” by Dalin et al.

General comments The paper presents a new data set, namely Stratospheric balloon measurements of Noctilucent clouds. Stratospheric balloon measurements are a rather new way of observing these clouds. The author claims that this new method has several advantages as listed in the manuscript, and as such I would expect it to yield new information about the clouds. However, in my view the manuscript mostly describes the observations, and is lacking such information. I believe more insights can be drawn from the data set by performing detailed studies such as time evolution of the cloud

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movements/growth. I also have an issue with the nomenclature of the paper. I do not believe these voids are the same as the much larger ice voids seen by CIPS Bailey et al. (2009) and Thurairajah et al. (2013b) or by Megner et al. (2018), since the sightings there were of a single void in an otherwise fairly homogeneous PSC cover. The formations here seem less round, and more like openings in an inhomogeneous cloud cover. Moreover, as the authors point out these features move with the wind, was not the case in Megner et al (2018). I therefore think it would cause confusion to name these by the same term 'ice voids', and suggest that the authors come up with another term.

Specific comments 153-154 and Figure 3: It is unclear if the marked area is the actual PSC coverage or the observation area, or both, i.e. that the whole observation area was filled with clouds. 189-193: Please explain how a large-scale gravity wave could produce the shapes/patterns of the cloud openings. 229-232: I do not believe one can determine that this is a vertical modulation from only one picture. If you have several pictures from different angles then this could be determined, but from one picture it is not possible to separate horizontal and vertical modulation. Figure 4 and 5: It is very difficult to judge the shape and clarity of the cloud openings when there are pre-drawn red lines to guide the eye. Please remove those. They could be replaced by arrows if you find it necessary. Technical Corrections 177: remove 'there should be fulfill'

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