

## ***Interactive comment on “Characterising regime behaviour in the stably stratified nocturnal boundary layer on the basis of stationary Markov chains” by Carsten Abraham and Adam Monahan***

**Carsten Abraham and Adam Monahan**

abrahamc@uvic.ca

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»>We are very thankful to the reviewer for the suggestion to improve our manuscript, in particular for the detailed correction of our equations describing the hidden Markov model. We did not submit the current study as a Part IV extension to our J.Atmos.Sci. series as that paper series deals with determining the climatology of SBL regime dynamics across the tower data which is also used for this study. In contrast to those climatologies, the paper at hand is intended to work towards stochastic parameterisations of turbulence in the SBL which we found more appropriate as a stand alone paper in this Journal. As we have included the discussion of a parameterisation and its test

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in a single column model (as suggested by reviewer#1) which has lead to a complete new paper structure, the paper is related to the previous studies to a lesser extent. The revised manuscript is attached.

Comments 1-3: As mentioned above we are very thankful for the careful and detailed corrections of our equations describing the assumptions for the HMM analysis. We have adopted your suggestions to correct our equations and hope that they have also become easy to understand (cf. section 3 of the new manuscript).

Comment 4: The term “diel” has been changed to “diurnal”

Please also note the supplement to this comment:

<https://www.nonlin-processes-geophys-discuss.net/npg-2018-44/npg-2018-44-AC1-supplement.pdf>

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Interactive comment on Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2018-44>, 2018.

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