

# ***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 for the reviewer’s suggestion to justify the assumptions of the Markov model approach in terms of its applicability for stable boundary layer regime dynamics in more detail. In the introduction of the new manuscript we justify our choice of testing the Markov model assumption as a foundation for SBL regime dynamics (cf. p.4 ll. 1-11). However, as it turns out the Markov model does not suffice to model SBL regime dynamics (p.10 ll. 1-5) we do not overrate its potential and do not try to speculate which particular physical properties might or might not be approximated by a Markov assumption. Instead, we lead the discussion to the finding that additional com-

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plexity in a possible stochastic parameterisation is needed (state dependent transition probabilities; section 5.1) and how we can develop a realistic yet simple stochastic parameterisation (cf. section 5.2). Justification for particular choices of building the stochastic parameterisation representing typical physical SBL phenomena are stated in those sections.

The revised manuscript is attached.

Please also note the supplement to this comment:

<https://www.nonlin-processes-geophys-discuss.net/npg-2018-44/npg-2018-44-AC2-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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