

# ***Interactive comment on “Minimal dynamical systems model of the northern hemisphere jet stream via embedding of climate data” by Davide Faranda et al.***

## **Anonymous Referee #2**

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This paper proposes a stochastic coupled map lattice (CML) model to describe dynamics of latitudinal position of the Northern Hemisphere atmospheric jet at each longitude with a stated goal to evaluate how this model represents the dynamical features of the jet. The manuscript needs to be substantially improved before I can recommend it for publication. In particular, presentation of the CML model lacks clarity for general readership, as well as interpretation and significance of some results are overstated.

### Comments:

1. Please provide some background on CML and why it has been chosen for this study.
2. Please provide more mathematical details on return map in Section 3 and how it

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Discussion paper



can be used to estimate  $f(x)$ .

3. Why the particular form of Eq (4) is chosen and how these coefficients are estimated?
4. What about uncertainties in the model coefficients? Fig.3 shows that red line (Eq.4) seem to be missing excursions that are very few to begin with.
5. It is rather hard to follow the discussion of the stochastic noise terms and it leaves impression that they are tuned without much mathematical guidance.
6. The Fig.7 comparison of summary statistics (ACF and PDF) for the optimal value of  $\epsilon = 0.4$  does not show much qualitative agreement between the modeled and observed dynamics (also in P15 in conclusions). The space-time patterns also look visibly rather different. It makes look weaker the rest of results on bifurcation analysis and dynamical indicators.

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Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2018-80>, 2018.