

Similarity and variability of blocked weather-regime dynamics in the Atlantic-European region

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This paper builds on previous work by the authors and others to examine how different categories of blocking are related to different kinds of forcing, derived from PV tendency analyses. It presents interesting new insight on the apparent similarity of the different categories of blocking, is clearly written and has good diagrams. My recommendation is to publish with minor corrections.

Points for the authors to consider:

l.76 'A distinct advantage of projections is, however, that variability in terms of mere geographical location of different patterns is eliminated and thus the variability of dynamical processes is more directly intercomparable.' How does this statement (repeated on l. 470) tally with equation 2, where the weather regime index is calculated by correlation of an instantaneous pattern to the weather regime patterns, the latter geographically fixed in terms of λ and φ ?

Fig 2. The most striking thing to me about fig 2 is that the four coloured traces are almost identical, yet the authors do not mention this in lines 259-265 where the figure is discussed. No doubt I have missed something very obvious in the previous discussion, but I can't be alone in this, so please could the discussion be extended to explain why the coloured curves are so similar?

l.355-361. This paragraph does not explain how projecting PV tendencies on to the regime pattern minimises the impact of geographical differences, and I can't see any obvious reason why it should. Explain!

Typos and minor corrections

l.59, 365 remove comma

l.85 exceeds

l.102 regimes

Fig 1 caption: Year-round

l.184 Brackets incorrectly applied around reference. Also similar to (not as)

l.203 nonconservative

l.215 define LWA (I presume it's the same as A, the local finite-amplitude wave activity)

l.258 Brackets incorrectly applied around reference.

l.292 locations

Fig 5 caption: explain that top row is EuBL and bottom row GL. The left hand panels confused me because (I think that) negative blue contours are shown as solid, same as the

positive ones (i.e. all contours are positive). According to my reading of the text l.327, some of them should be negative.

l. 380 'either' suggests that there are only two pathways, yet that is not how the text reads
l.456 regime's