

# ***Interactive comment on “Climate Response Functions’ for the Arctic Ocean: a proposed coordinated modeling experiment” by John Marshall et al.***

**John Marshall et al.**

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We thanks Georgy Manucharyan for his encouraging comments and will address them all in revision.

Motivation of CRFs

We will indeed motivate our choice of CRFs more comprehensively and suggestions in 1a and 1b on how to do that are well taken. We will also make much more use of Georgy’s analytical model of equilibration of the BG to motivate Eq.4 of our manuscript. This enables us to clearly connect through to mechanisms.

Linearity

Linearity of our CRFs is critical if we are to use convolution theory in a predictive way. If we drive our system with very large wind anomalies then the response is not linear and less symmetric wrt change in sign of the forcing anomaly. However, for 'realistic' amplitudes of wind forcing the response is indeed 'usefully' linear, as we attempt to demonstrate in the paper. We will make this much clearer in revision.

#### Model resolution and parameterization

We believe that the models will be sensitive to resolution and parameterization and this is one of the motivations for our study. For example, resolution may be important in equilibrating the FWC of the BG either due to the ability to resolve eddies, but also boundary current and 'outward' (as well as inward) pathways.

#### Availability of FW to BG

This issue is an important one and indeed demands a more detailed discussion. This will be added in revision.

#### Data output and postprocessing

A fuller description will be given in the body of the paper but we prefer to devolve this to the associated 'protocol' writeup that goes along with the paper. This is still being fleshed out after discussion with the FAMOS group. We will look in to also posting this on the GMD website.

#### Testing hypotheses and mechanisms

we agree that CRFs are very valuable in this regard, a point which will be expanded upon in revision.

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