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# Anomaly method improvements through phase initialisation in model space

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Anomaly initialisation for decadal predictions is eliminating the model drift of the mean state, but in opposite is adding uncertainity on the projected initial state gradíents, in model's space.
This leads to disturbed modes of variability's initial phase - an important source driving decadal predictability.

A new method of anomaly initialisation - focused to preserve this time the main spectral characteristics of the initial state projected in model space - has been implemented. Observed and model phases are estimated using lagged time correlations from an ensemble of control runs.

The initialisation method was developed from an extended ensemble of available decadal prediction experiments that were done for COMBINE, then implemented in EC-EARTH and tested in decadal simulations with startdates every 5 years.
We analyse the skills from decadal experiments using the "classical" and the new anomaly initialisation method when compared to observations.

In particular we show that phase/amplitude initialisation in a reduced model space - of the main coupled ocean-atmosphere modes of variability - has a significant impact improving the variability on decadal scale compared with grid point initial departure minimisation.