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AEWs in IPCC run: XX century case.

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We compare for the overlapping time frame 1962-2000 the representation of the African atmospheric variability of the available XX century simulations of GCMs included in the Intergovernmental Panel on Climate Change – 4th Assessment Report with the reanalyses of NCEP-NCAR.

We adopt the classical approach of computing the Hayashi space-time decomposition of the meridional wind at 700 hPa, that we consider as a good index of African Easterly Waves (AEWs) activity. Straightforward space-time decomposition will not distinguish between standing and travelling waves: a standing wave will give two spectral peaks corresponding to travelling waves moving eastward and westward at the same speed and with the same phase. The problem can only be circumvented by making assumptions regarding the nature of the wave.

This approach relies in attributing complete statistical coherence between the eastward and westward components of standing waves and on attributing the incoherent part of the spectra to real travelling waves. By computing the cross spectra and the coherence of the signal, the method allows for separating statistically the propagating and the standing components of the atmospheric waves.

So, the space-time spectra are computed for each of the 39 years included in our datasets spanning the time frame 1962-2000. The westward components of the spectra computed for each IPCC model are taken into account. The models show over this area a wide range of behaviours, making apparent the difficulty for reproducing the variance over the WAM region.