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# Wind-driven Oscillations in the Meridional Overturning Circulation near the equator

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Numerical model studies have shown the meridional overturning circulation (MOC) to exhibit variability on near-inertial timescales, and also indicate a region of enhanced variability on the equator. We present an analysis of a set of integrations of a global configuration of a numerical ocean model, which show very large amplitude oscillations in the MOCs in the Atlantic, Indian and Pacific oceans confined to the equatorial region. The amplitude of these oscillations is proportional to the width of the ocean basin, typically about 100 (200) Sv in the Atlantic (Pacific). We show that these oscillations are driven by surface winds within 10°N/S of the equator, and their periods (typically 4-10 days) correspond to a small number of low mode equatorially trapped planetary waves. Furthermore, the oscillations can be well reproduced by idealised wind-driven simulations linearised about a state of rest. Zonally integrated linearised equations of motion are solved using vertical normal modes and equatorial meridional modes representing Yanai and inertia-gravity waves. Idealised simulations capture between 85% and 95% of the variance of matching time-series segments diagnosed from the NEMO integrations. Similar results are obtained for the corresponding modes in the Atlantic and Indian Oceans. Our results raise questions about the roles of inertia-gravity waves near the equator in the vertical transfer of heat and momentum and whether these transfers will be explicitly resolved by ocean models or need to be parametrised.