



Diagnosing the annual cycle of the equatorial undercurrent in the Atlantic ocean from a general circulation model

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Ten-year long output series from a general circulation model forced by daily realistic winds are used to analyse the annual cycle of the Equatorial Undercurrent (EUC) in the Atlantic. Two well-defined transport maxima are found: One, present during boreal summer and autumn in the central part of the basin, is generally regarded as a near-equilibrium response to the equatorial easterly trades which culminate in this period. Another one, most pronounced near the western boundary, occurs in April-May when the trades relax. Observational evidence for the spring EUC maximum is given, based on previously published results. As this intensification appears at periods when the boundary between the tropical and equatorial gyres nears the equator, its existence is related to wind stress curl variations at sub-equatorial latitudes. A link between the inter-annual variability of the spring transport maximum and that of the low-latitude wind stress curl is indeed found in the model. This diagnostic approach suggests that two different dynamical regimes might shape up the EUC seasonal cycle: In summer and autumn, local forcing by the equatorial zonal wind component, and main supply from the ocean interior; in winter and spring, remote forcing by the low-latitude rotational wind component, and supply from the western boundary currents.