

Gulf Stream and Kuroshio Current are synchronized

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Abstract

Sea surface temperatures (SSTs) of the Gulf Stream and the Kuroshio are shown to be synchronized for the decadal time scale. This synchronization, which we refer to as the Boundary Current Synchronization (BCS), is associated with meridional migrations of the atmospheric jet stream. The singular value decomposition (SVD) between SST and zonal wind shows that, within the context of known climate modes, BCS can be understood as the covariability shared by the Pacific Decadal Oscillation and the Northern Annular Mode. Nevertheless, because the SVD time series exhibit high correlations with the zonal-mean meridional SST difference between the subtropics and the midlatitudes, BCS can be understood more simply as an oceanic annular mode. Air temperature regressed on the BCS index exhibits a similar spatial pattern to temperature observed in July 2018.