Abstract for Frontal Scale Air-Sea Interaction Workshop:

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Title: Interannual Variability of the Agulhas Leakage and Shifts in the Agulhas Return Current Path

Unlike northern hemispheric western boundary currents where the current separates from the coast and flows eastwards to form oceanic fronts, the Agulhas current splits and feeds the Agulhas leakage and Agulhas Return Current (ARC). The Agulhas leakage forms a major part of the returning upper branch of the AMOC and hence has huge climate implications, while recent studies have shown that the position of the ARC anchors storm tracks in this region. Using high resolution Community Climate Systems Model (CCSM3.5), the ARC is resolved and a reasonable Agulhas leakage is captured. However, it is unclear what controls the Agulhas leakage and frontal position of the ARC. As such, we construct indices to measure the variability of these variables on interannual and longer timescales. We find strong but opposite signs correlation of the Agulhas leakage index and the ARC frontal position lagging zonal wind stress over eastern Indian ocean by 4 years. This corresponds to the timescale of oceanic Rossby wave adjustments to basin-scale wind stress forcing over the Indian ocean, which suggests the role of ocean dynamics in setting the variability of the Agulhas leakage and ARC path shifts.