**Atmospheric stratification and mixed layers in the monsoon**

The atmosphere over the Arabian Sea was observed in the July 2023 monsoon by radiosondes released from the research vessel Revelle after the passage of tropical cyclone Biparjoy. A stack of mixed layers with either adiabatic or moist adiabatic density structures is observed: (1) an adiabatic subcloud layer, (2) a moist-adiabatic shallow cumulus layer, (3) an adiabatic mixed layer June 17-20, (4) a moist-adiabatic dry layer above 600 hPa. The cumulus layer is shallow, consistent with previous work. The role of the mixed layers in drying the lower troposphere, vertically trapping the shallow cumulus layer, and inhibiting precipitating deep convection is investigated with large eddy simulations and reanalysis. Geostrophic monsoon winds have strong jets and wind shear. A proposed mechanisms is that shear-generated mechanical mixing homogenizes layers above the shallow cumulus plantetary boundary layer (PBL), keeping the top of the PBL shallow and capped by a stable inversion.