Variability of South Pacific Subtropical Gyre

*Tangdong Qu[1,2], Linlin Zhang[2]

1.JIFRESSE, University of California, Los Angeles, CA, 2.IPRC/SOEST, University of Hawaii, Honolulu, HI

Taking advantage of the decade-long Argo data, this study investigates the variability of South Pacific subtropical gyre. Both sea level and steric height exhibit a linear increasing trend in the subtropical South Pacific, with its maximum value taking place in the western part of the basin. The increase north of 30ºS is primarily caused by variability in the upper 500 m, while the increase south of 30ºS is driven by variability in the whole water depth from the sea surface to 2000 m, with contributions from below 1000 m accounting for about 50% of the total variance. Most of this linear trend is due to thermal expansion, except in the deep ocean where haline contraction is of equal importance. A spin-up of the South Pacific subtropical gyre is seen during the Argo period, and the spin-down during 2002-04 reported by previous studies is merely an interannual perturbation. Atmospheric forcing of this variability is discussed.

