International workshop on seasonal to decadal prediction
Toulouse, France, 13-16 May, 2013

Control of decadal and bidecadal climate variability in the tropical Pacific by the off-equatorial South Pacific Ocean

Hiroaki TATEBE

Research Institute for Global Change, JAMSTEC, Japan, tatebe@jamstec.go.jp
Yukiko Imada, Masato Mori, Masahide Kimoto, Hiroyasu Hasumi
Presenter : Hiroaki Tatebe

Delayed negative feedback processes determining intrinsic decadal and bidecadal timescales for the tropical variability in the Pacific are investigated based on climate model experiments. By comparing a control run driven by preindustrial forcing and the partial blocking runs driven by the same forcing but with ocean temperature and salinity restored to climatology in selected regions, subsurface oceanic signals of the South Pacific origin turn out to precede the SST variability in the NINO3.4 region. Using a linear reduced gravity ocean model driven only by wind stress changes and an off-line tracer model, oceanic wave adjustment triggered by changes of wind stress curl in the South Pacific extratropics is suggested to be essential for the decadal component of the equatorial variability while slower isopycnal advection of subsurface temperature anomalies from the formation region of South Pacific Eastern Subtropical Mode Water controls the bidecadal component. The intrinsic timescales of the tropical variability are regulated by simple linear ocean dynamics.