Sensitivity of ENSO-like anomalies simulated with an Intermediate Coupled Model to the parameterization of the atmospheric convection.

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ENSO-like simulations produced by the Cane and Zebiak's model over the equatorial Pacific have been compared with observed anomalies derived from Reynolds SST, FSU winds, ISCCP high-cloud convection and hydrographic profiles derived from Smith (1995).
Part of the model deficiencies is characterized by too strong wind anomalies being generated too close to the SST anomalies, with a strong wind convergence in the Eastern Pacific and equatorial westerlies located 40 degrees to the east of observed features. A similar deficiency in the wind is also present when the model is run with a new parameterization of the subsurface temperature derived from hydrographic profiles.
In addition, the model develops similar unrealistic wind patterns when it is run forced by observed SST anomalies, indicating that the atmospheric model component needs to be improved in order to reproduce realistic features.
The forcing applied to the atmospheric model is mainly driven by the surface local heating derived from the SST anomalies.
Adding a term derived from observed cloud convection improves substantially the wind simulations.
ISCCP and SST data are then analyzed to derive a new parameterization of this forcing . Not surprisingly,
coupled simulations are extremely sensitive to the choice of this parameterization.
Depending on the strength of the surface local heating relative to the convective heating, the model presents an ENSO-like behaviour with either overly strong wind anomalies in the East or a decaying behaviour with wind anomalies that propagate westward and die. We are investigating how these model deficiencies can be reduced by changing the oceanic and atmospheric model parametrizations within the limits prescribed from observations.