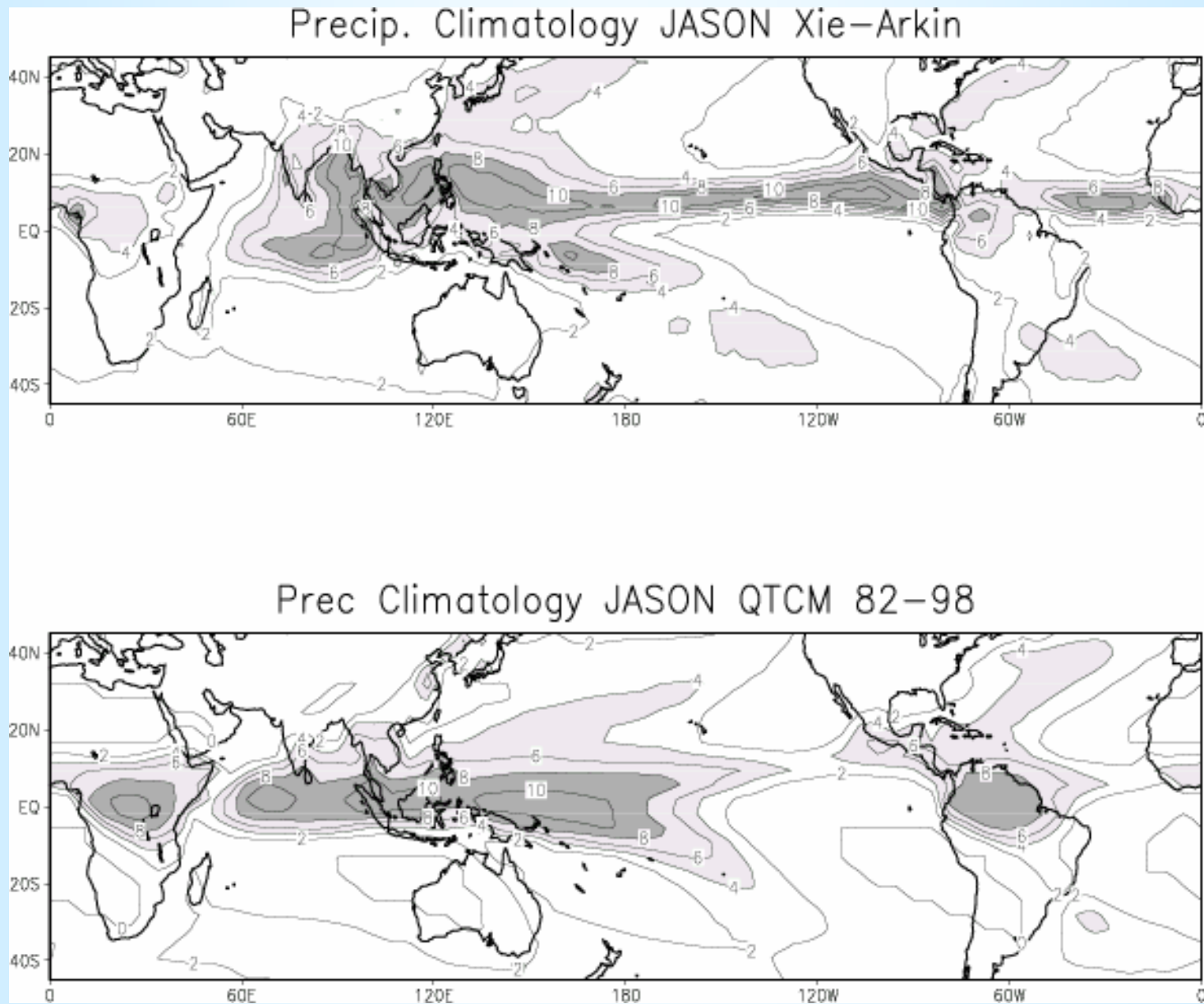


# **Teleconnections in Tropical Convection Zones: Convection-Land-Radiative Feedbacks in the 1997 Amazon Drought**

**J. David Neelin and Hui Su, UCLA**

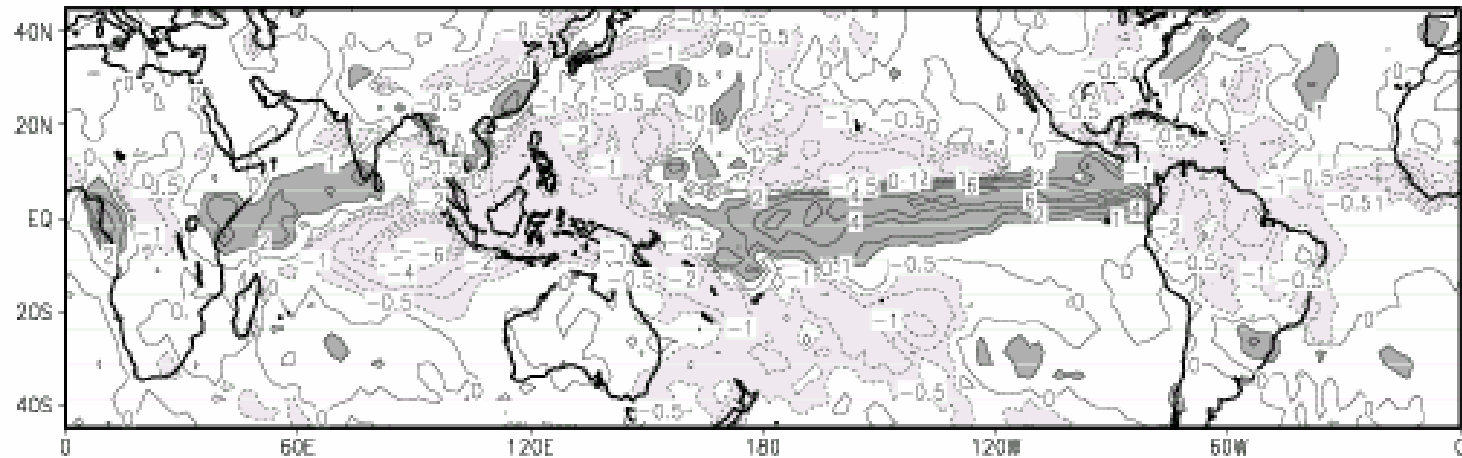
- 
- 
-

# Figure 1

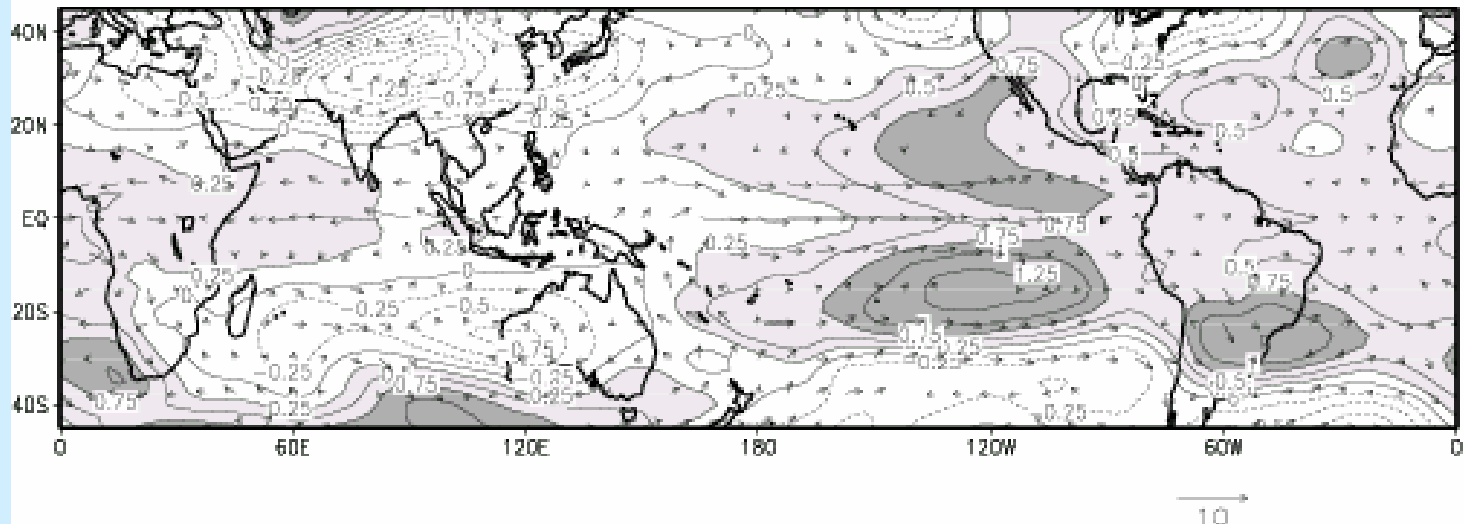


# Figure 2ab

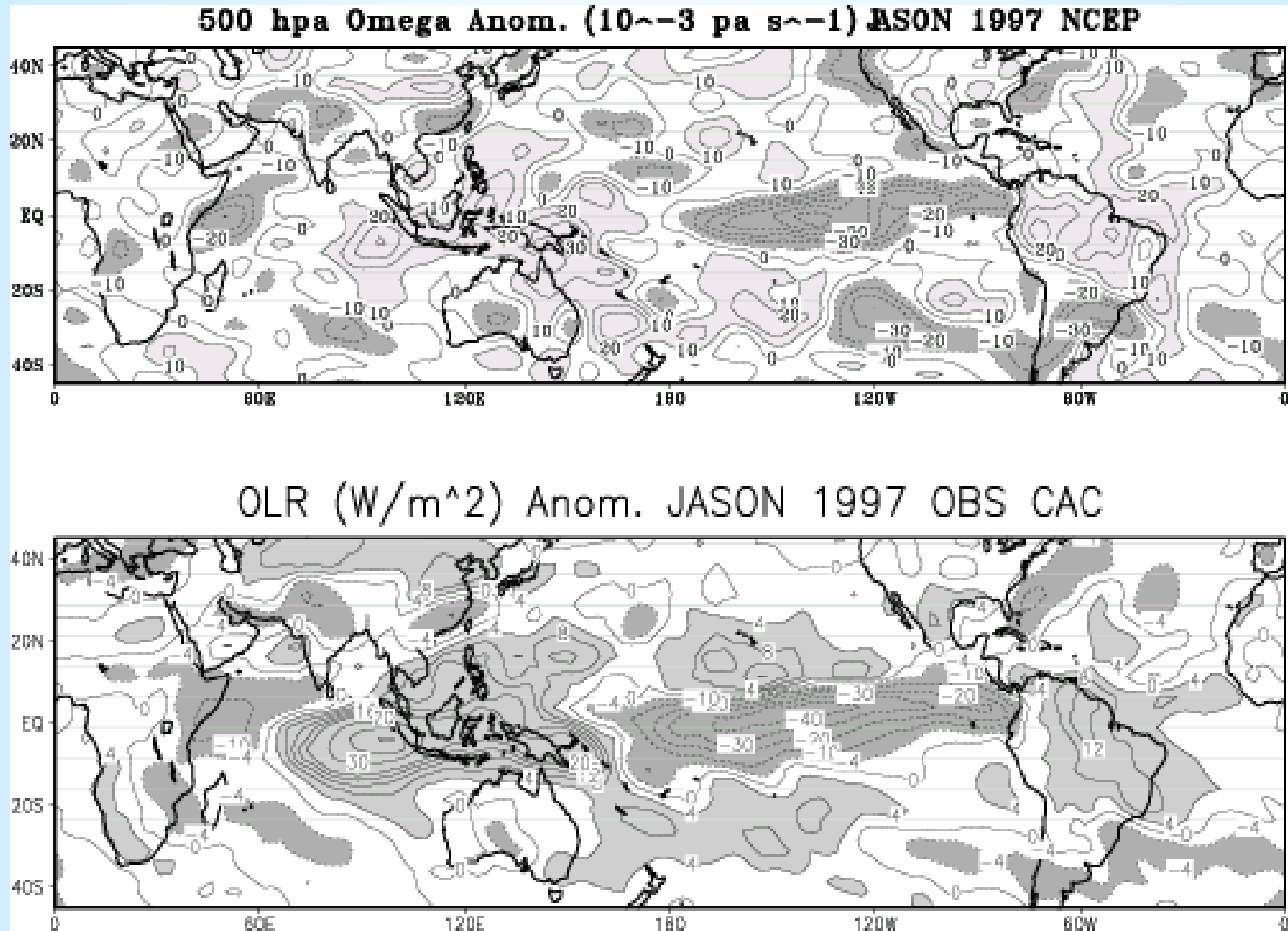
Precip. Anomalies JASON 1997 Xie-Arkin



Temp. (850–200 hpa) and Wind (850 hpa) Anom.  
JASON 1997 NCEP

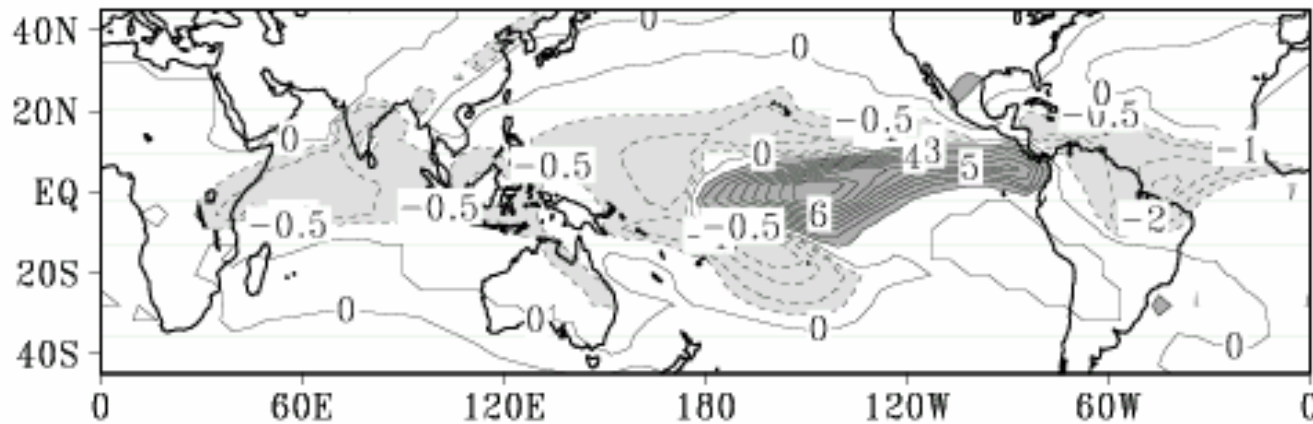


# Figure 2cd



# QTCM Response to Positive Pacific ENSO SSTA

(a) Precip. JASON 1997 POSPAC-CLIM



(b) Temp. (850–200 hpa) and Wind (850 hpa)

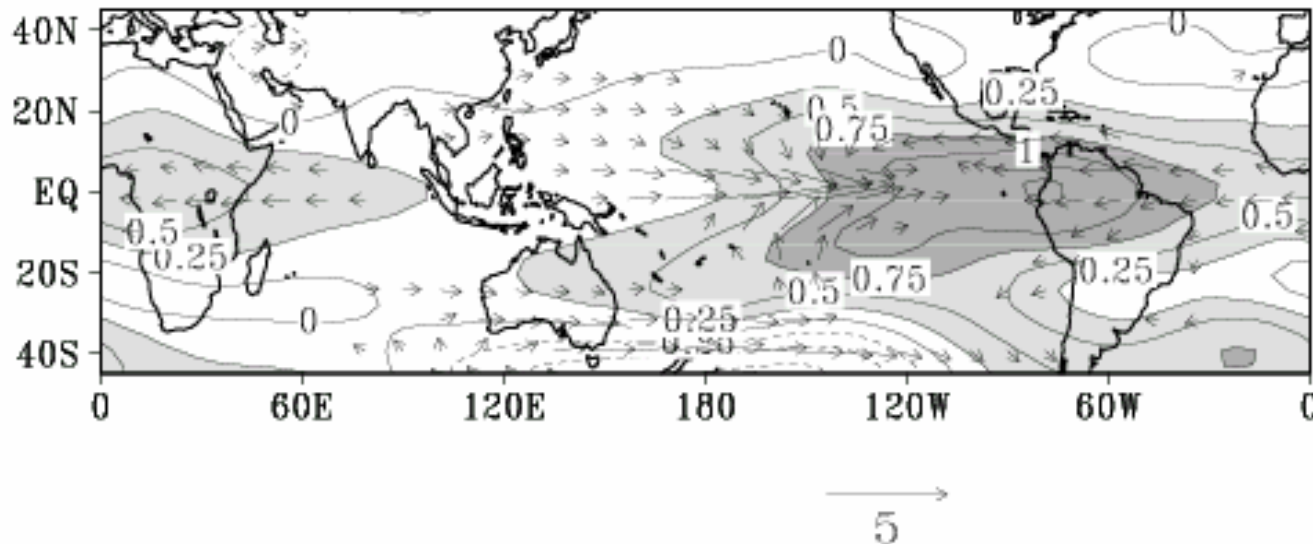
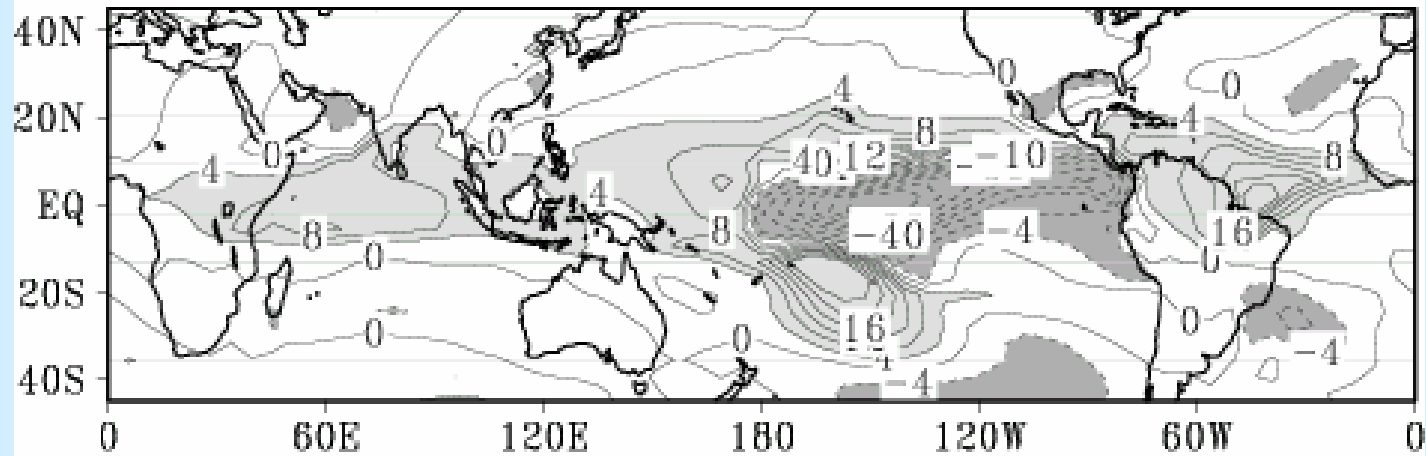
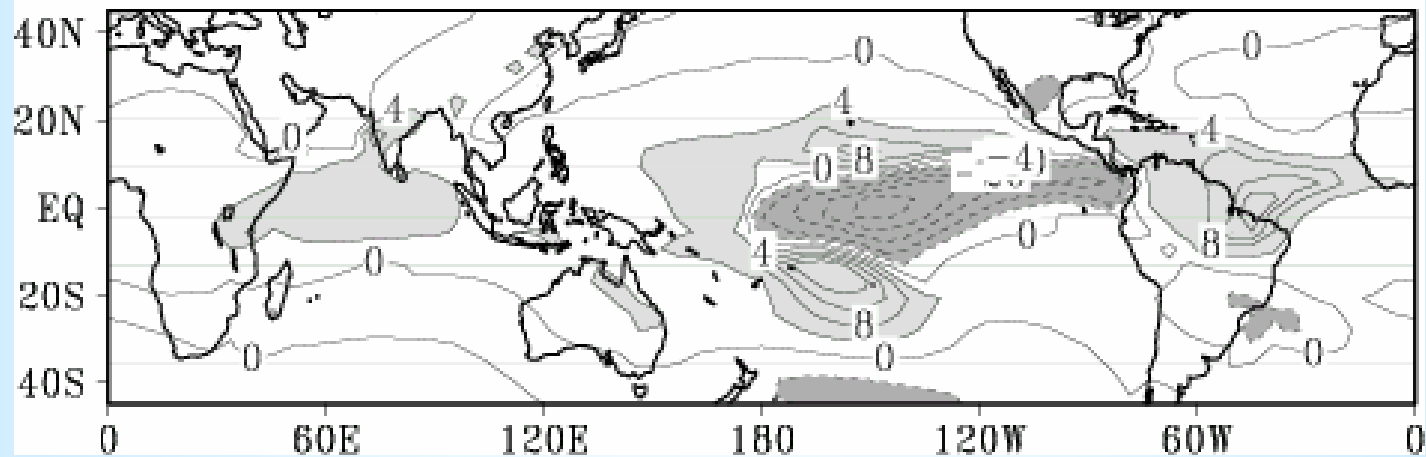


Figure 3 cd

(c) 500 hpa Omega ( $10^{-3}$  pa/s)

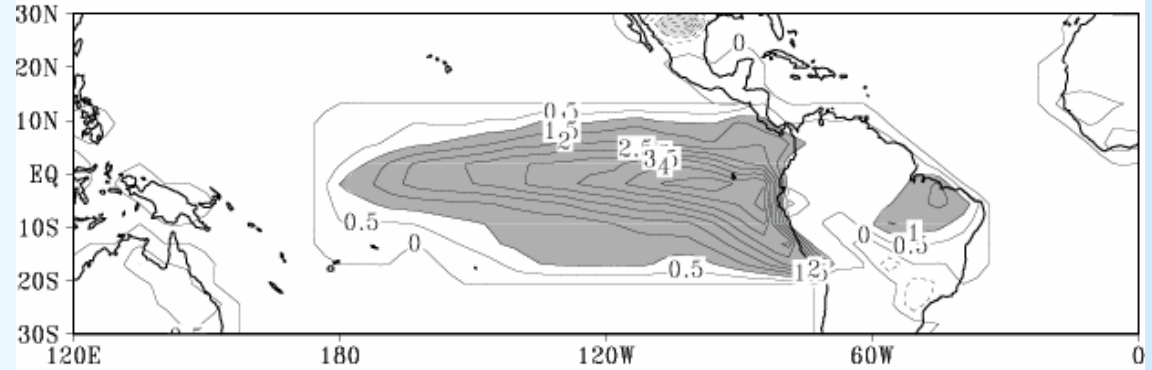


(d) OLR ( $W/M^2$ )

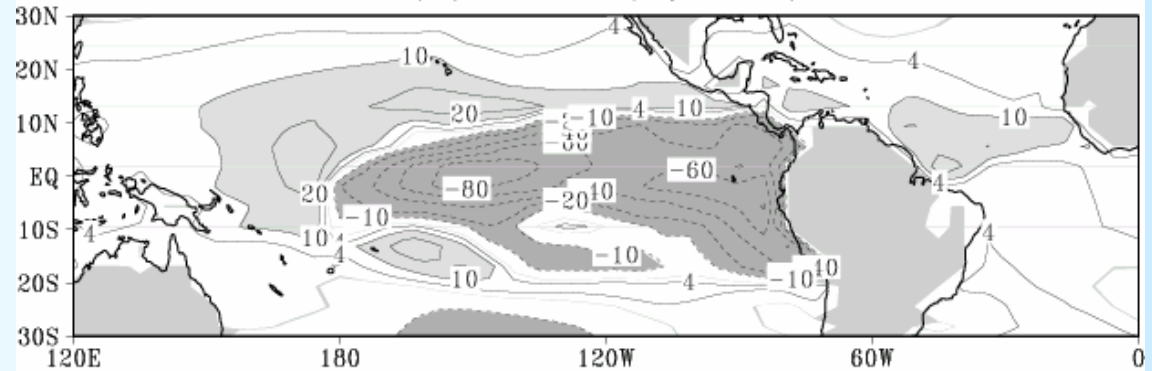


# QTCM POSPAC-Fluxes

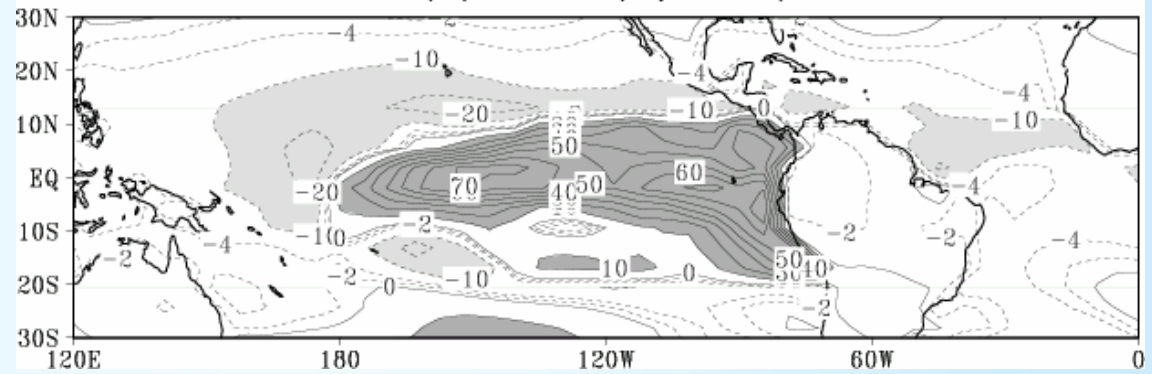
(a) Ts (C) JASON 1997 POSPAC-CLIM



(b) F<sub>sn</sub>net (W/m<sup>2</sup>)



(c) F<sub>net</sub> (W/m<sup>2</sup>)



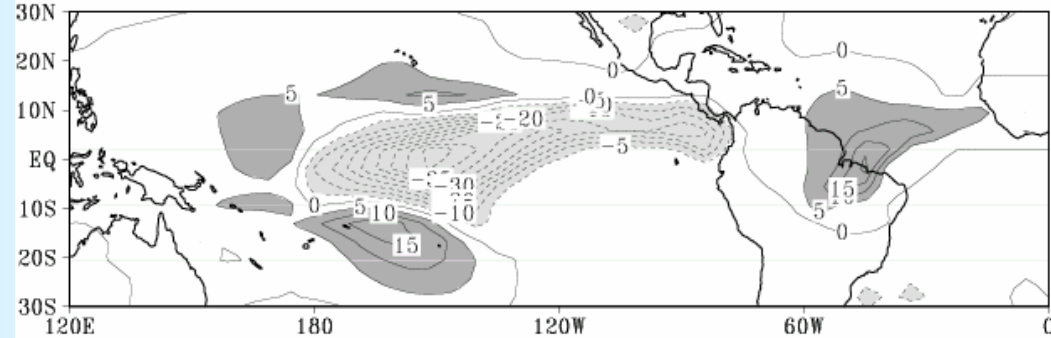
Surface temperature

Net surface flux

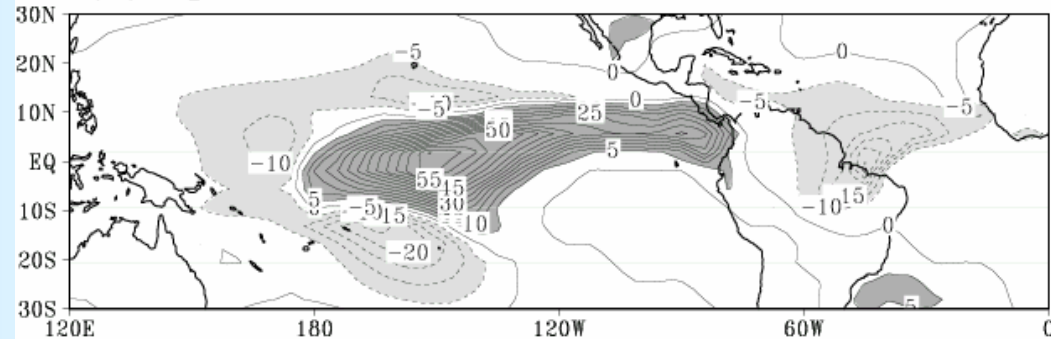
Net flux into  
atmospheric column

# QTCM POSPAC - Contributions to OLR

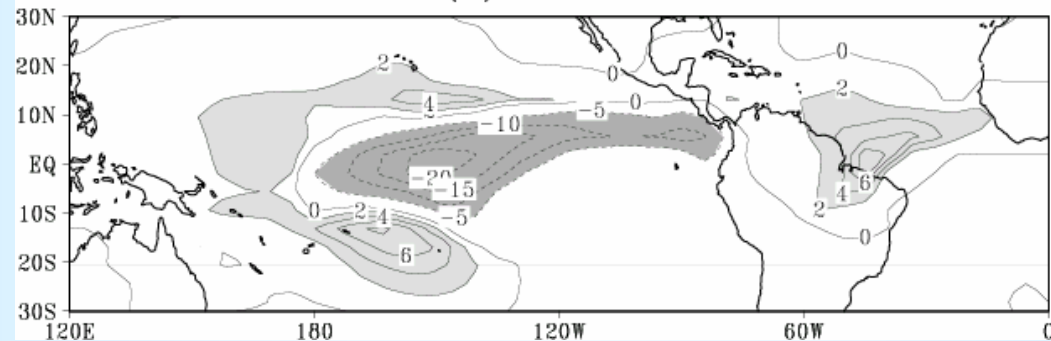
(a) OLR due to cloud ( $W/m^2$ ) JASON 1997 POSPAC-CLIM



(b) Upward solar radiation at TOA due to cloud



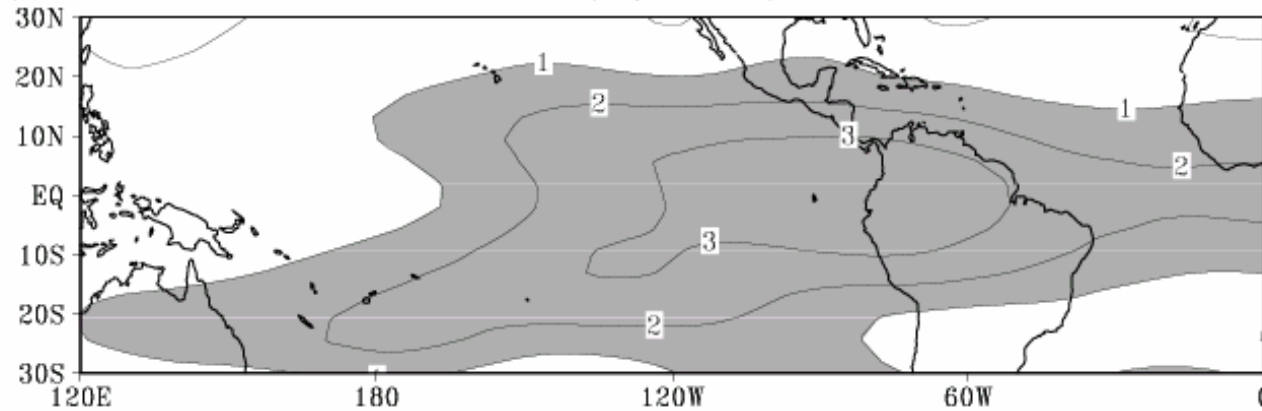
(c) TOA CRF



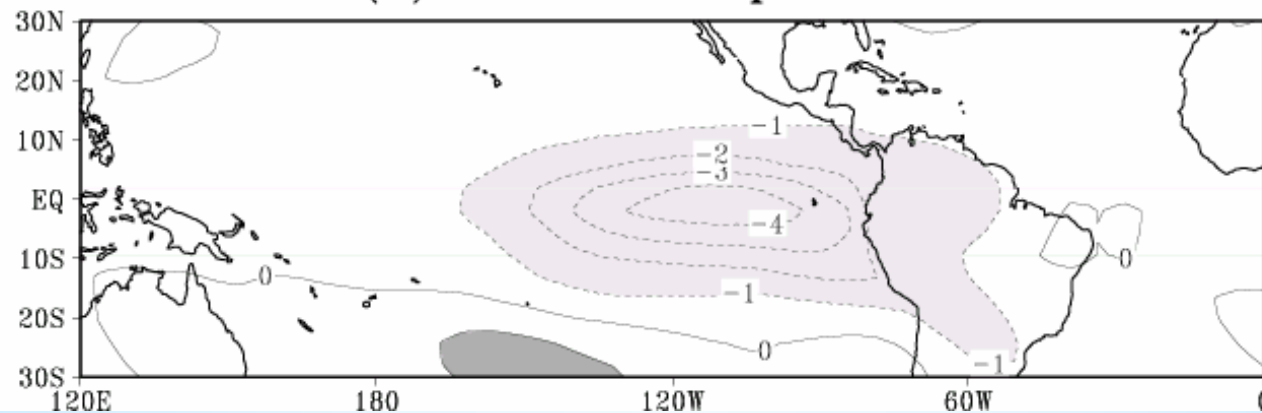


# QTCM POSPAC - Contributions to OLR

(a) OLR due to T1 Anom. ( $W/m^2$ ) JASON 1997 POSPAC-CLIM

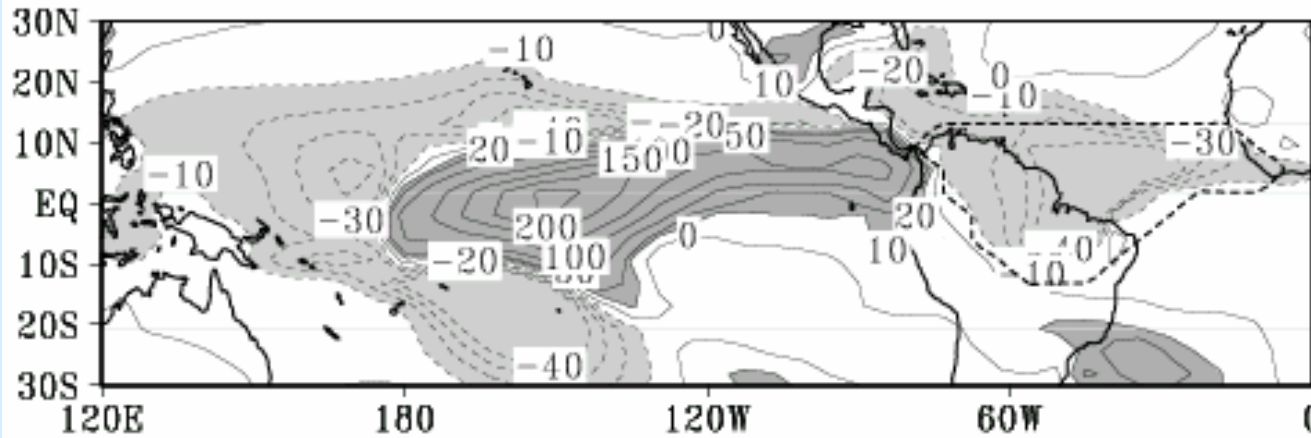


(b) OLR due to q1 Anom.



# Divergence Contributions to Moisture and Moist Static Energy Divergence

(a)  $Mq_{div}$  ( $W/m^2$ ) JASON 1997 POSPAC-CLIM



(b)  $M_{div}$  ( $W/m^2$ )

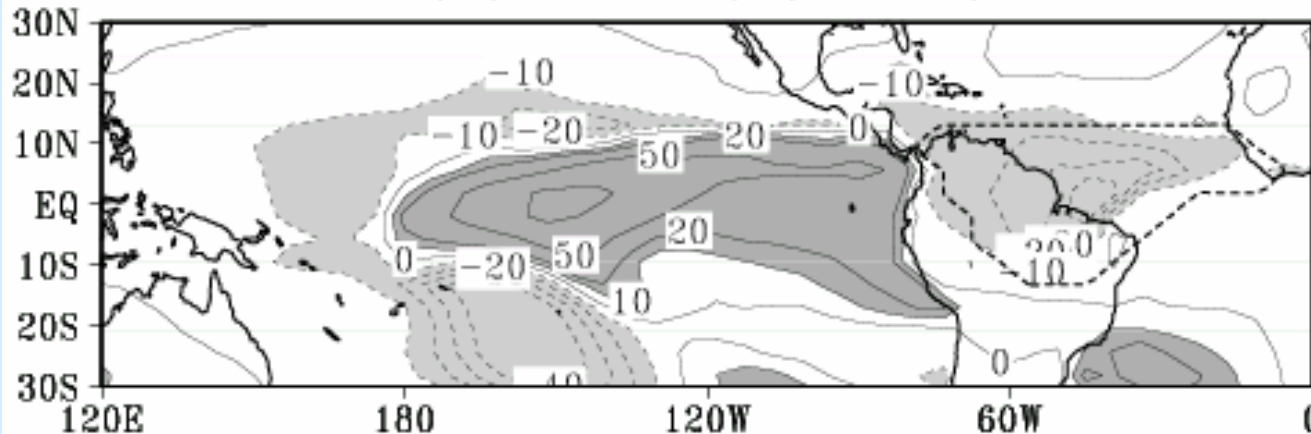
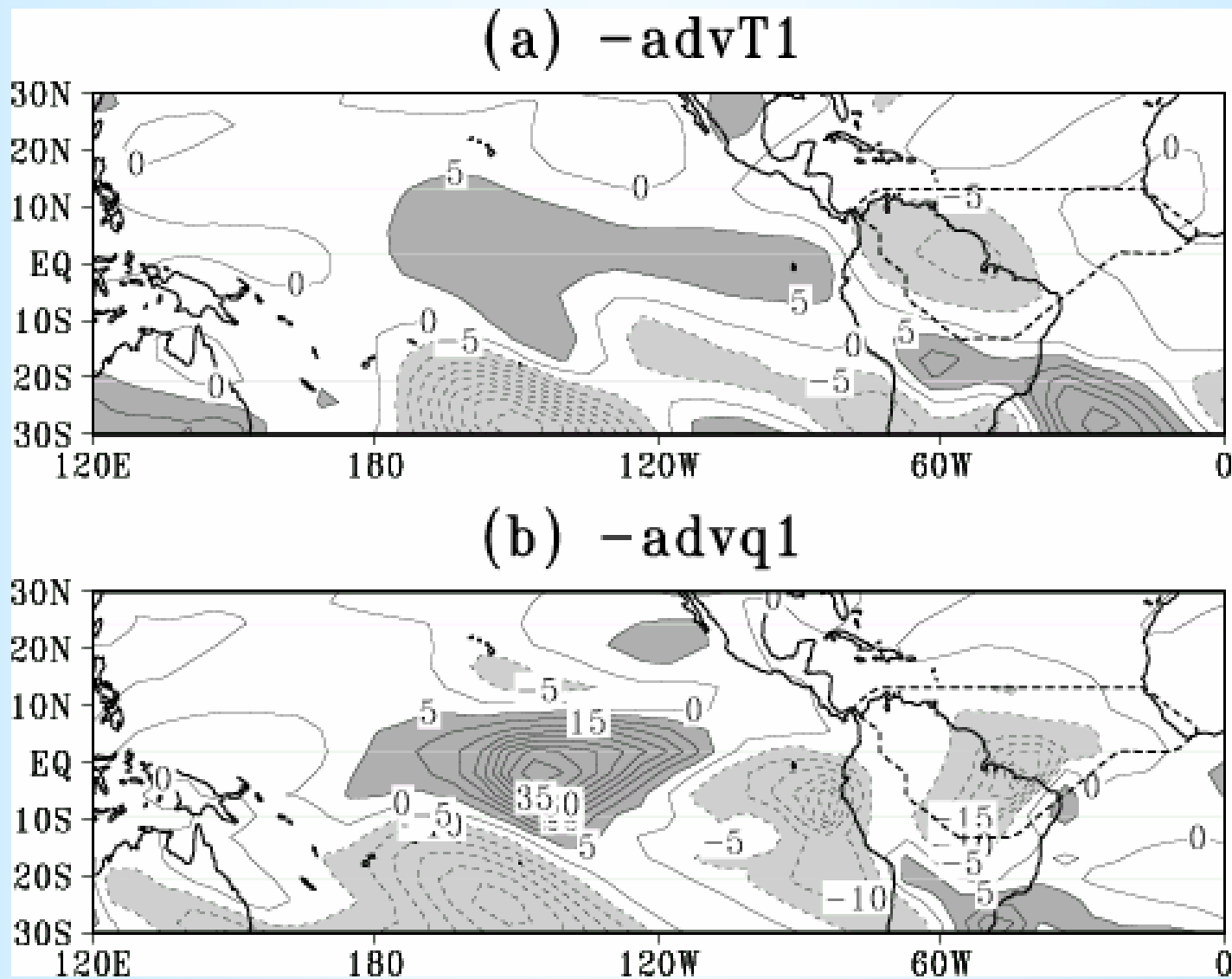
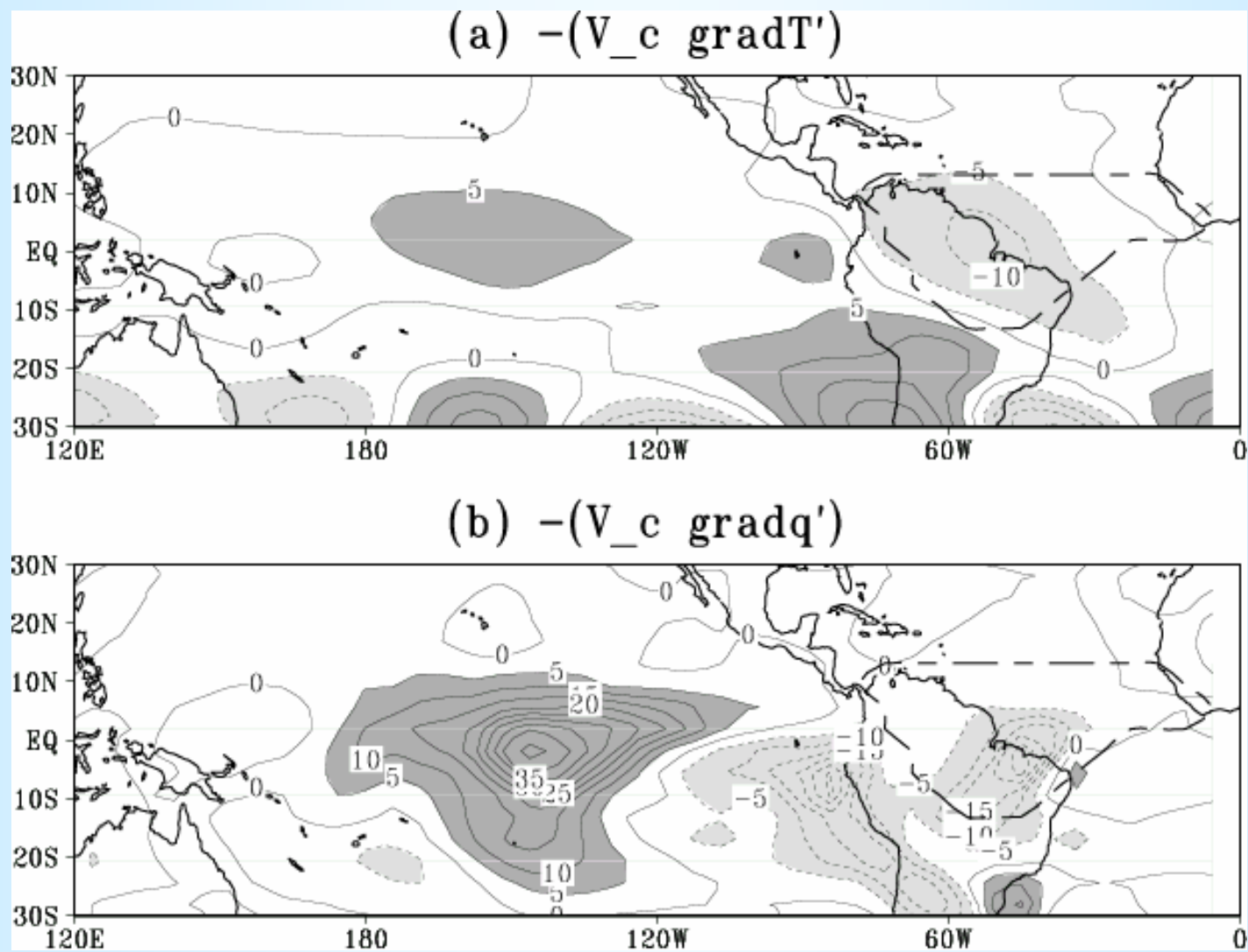


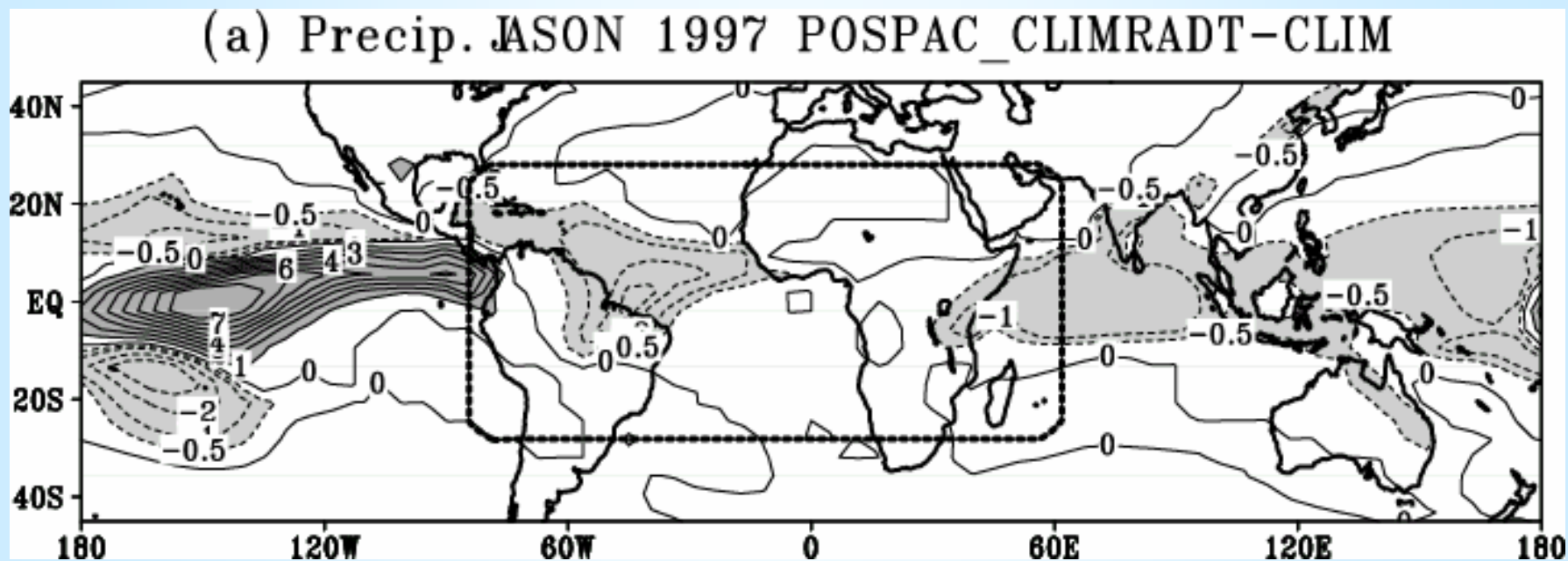
Figure 8



# Advection - main contributions



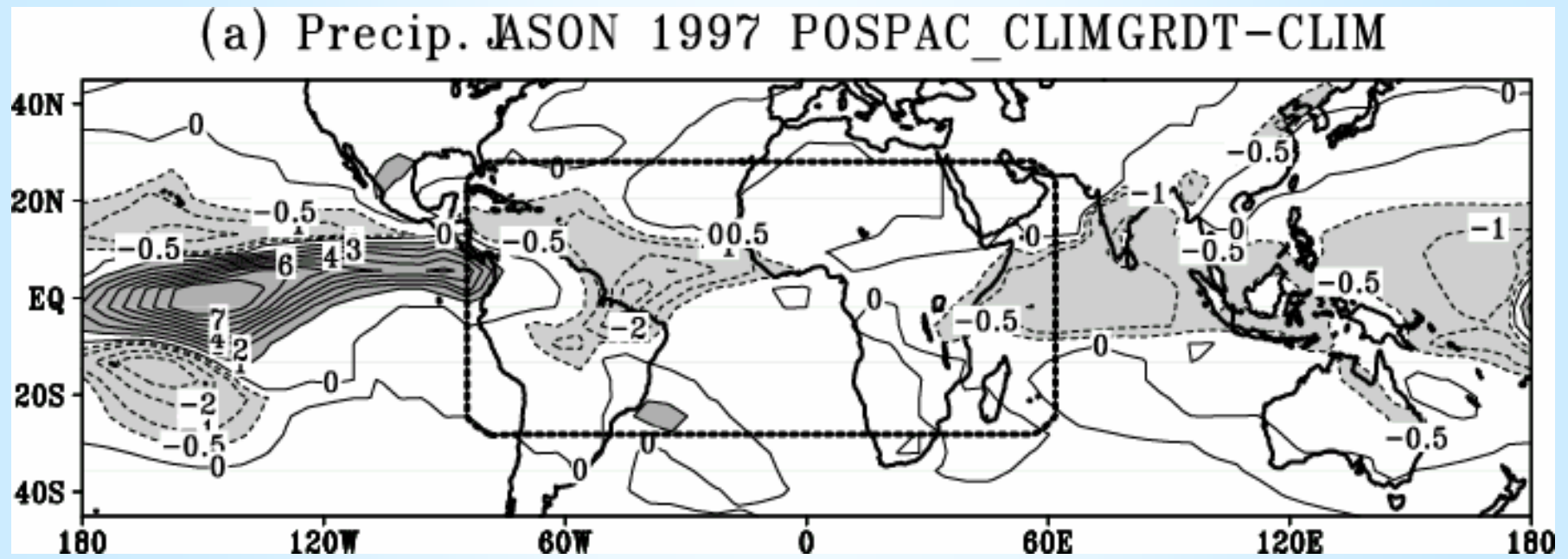
# QTCM Experiments suppressing potential mechanisms for descent anomalies



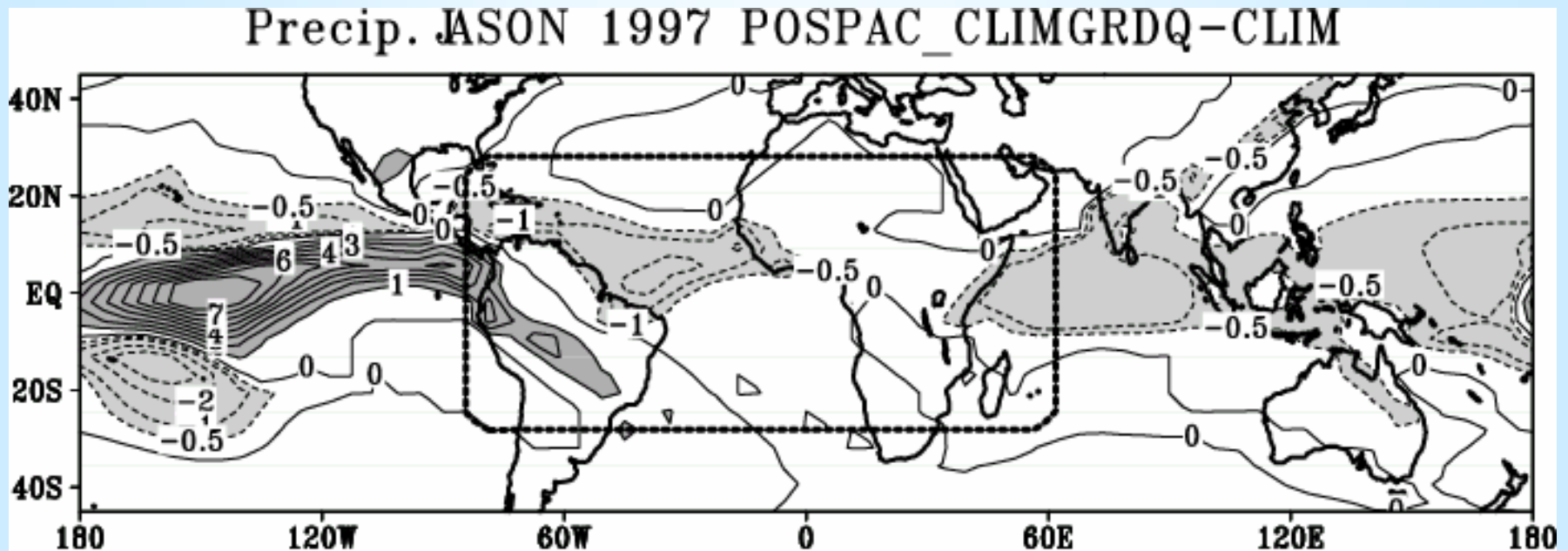
$T'$  radiative effects suppressed

( )' = anomaly

Figure 11



# QTCM Experiments suppressing potential mechanisms for descent anomalies

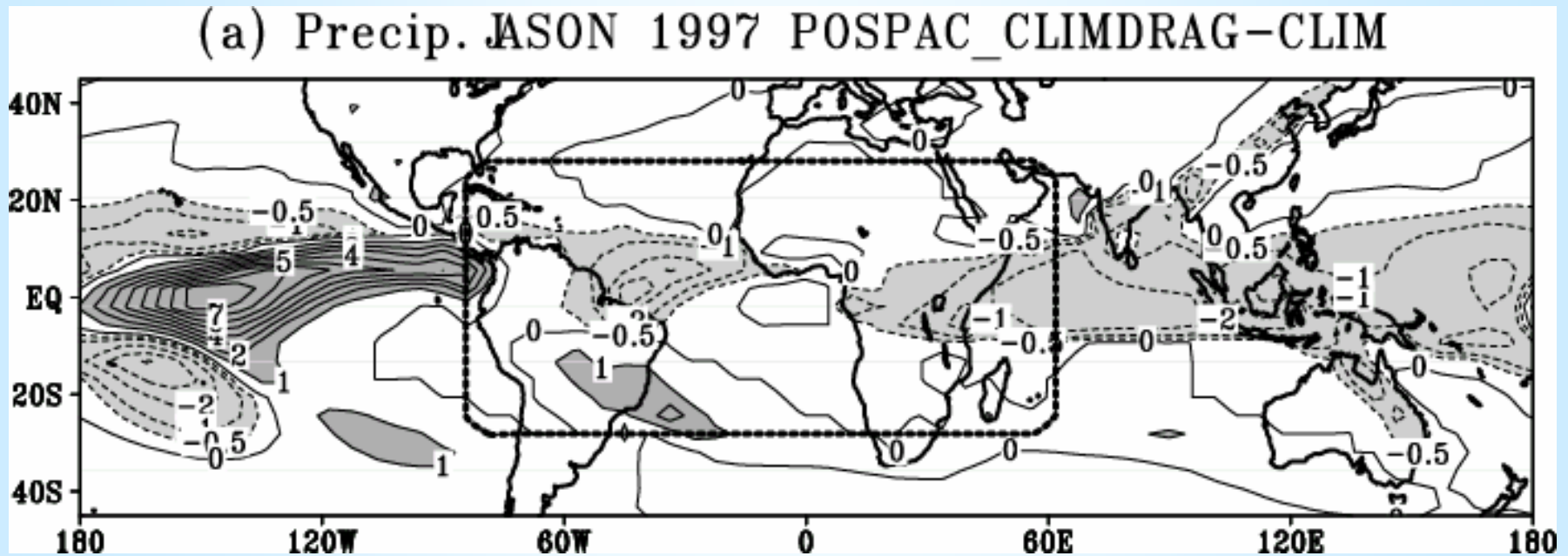


$(\mathbf{v} \cdot \nabla q)'$  suppressed

$( )' = \text{anomaly}$



# QTCM Experiments suppressing potential mechanisms for descent anomalies

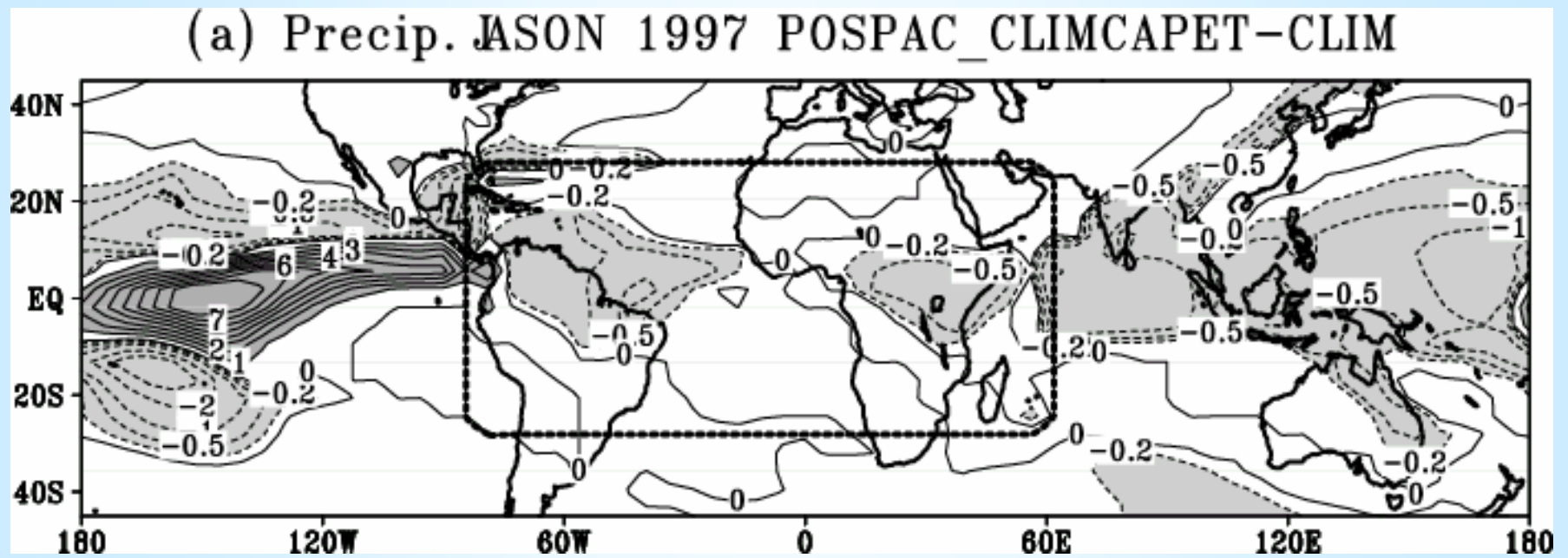


*(surface stress)*' suppressed

$( )'$  = anomaly



Figure 14



# Figure 15

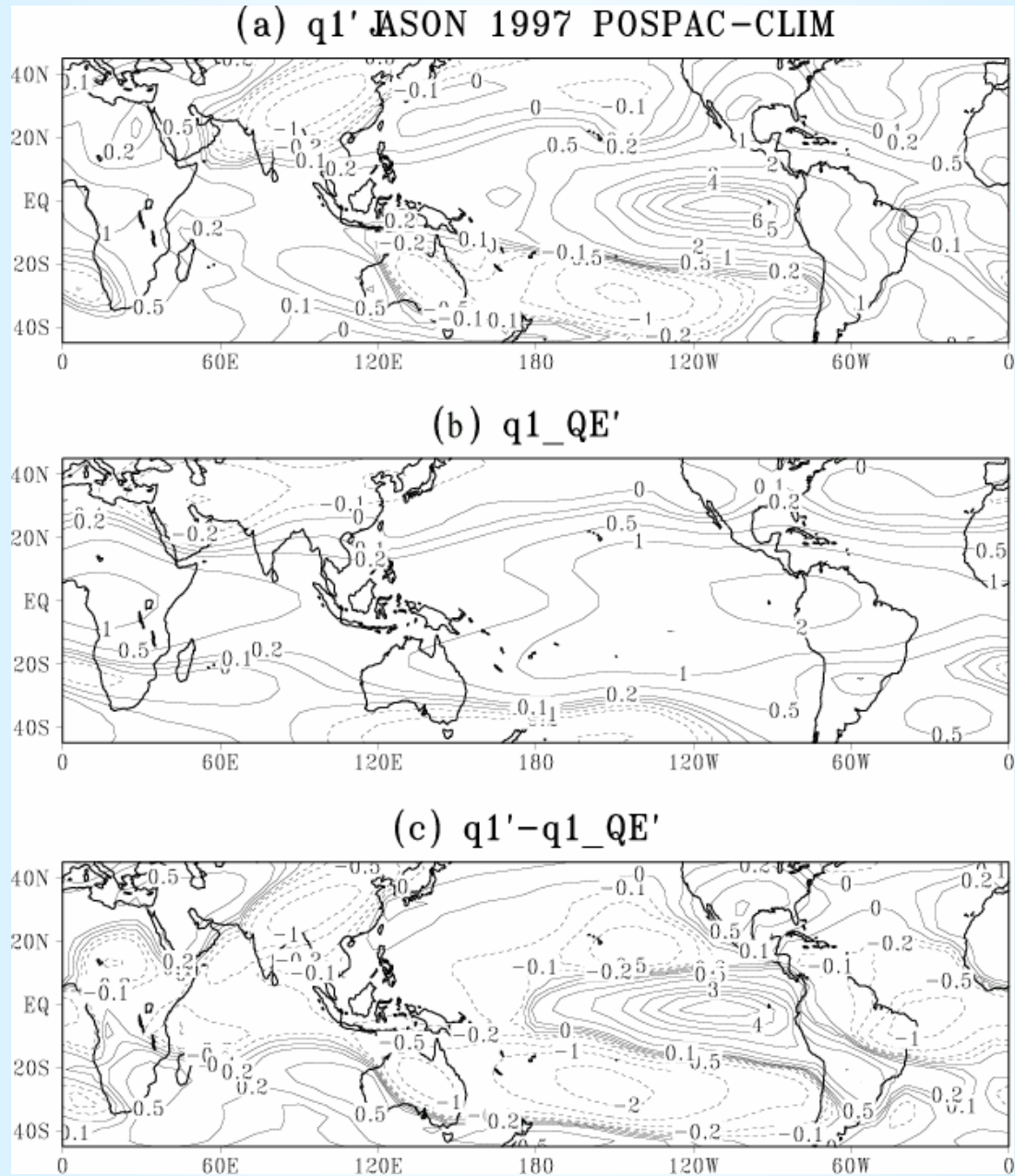
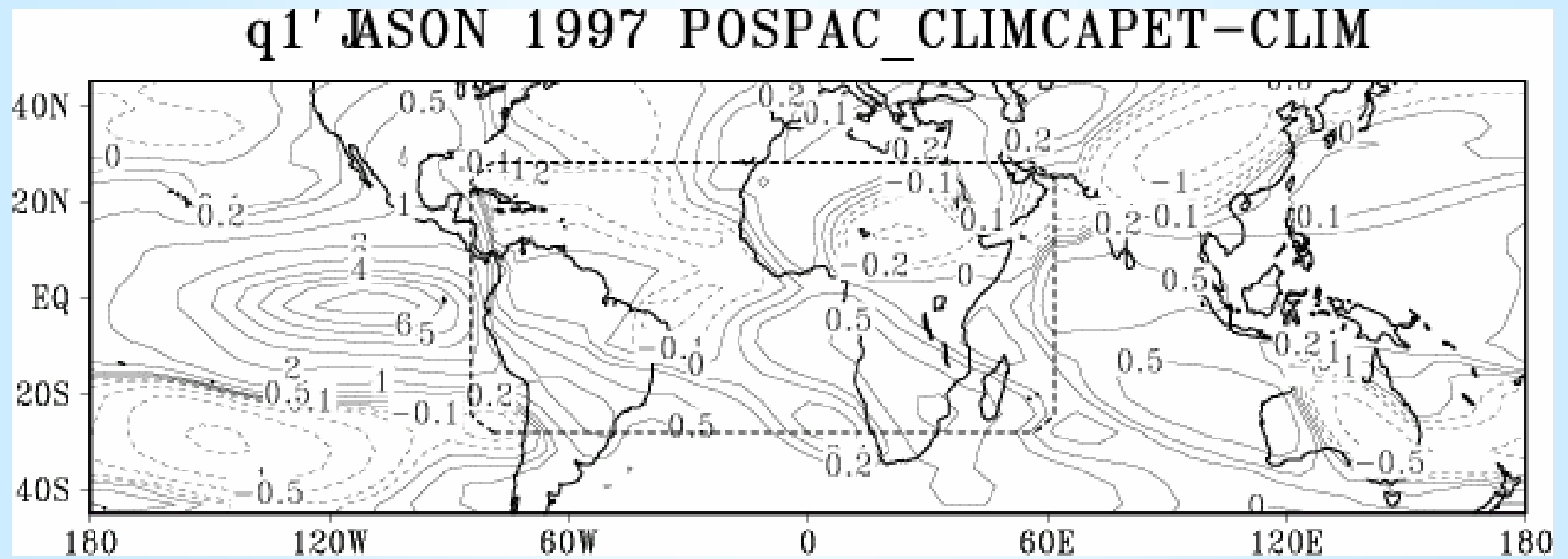


Figure 16



# QTCM experiments suppressing various mechanisms

Precipitation Anomalies

Anomaly ( )' term

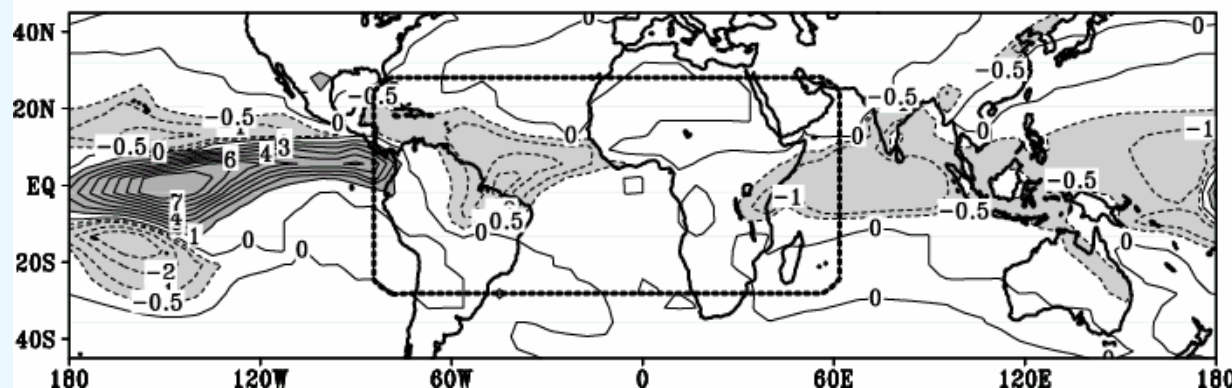
suppressed in region:

$T'$  radiative effects

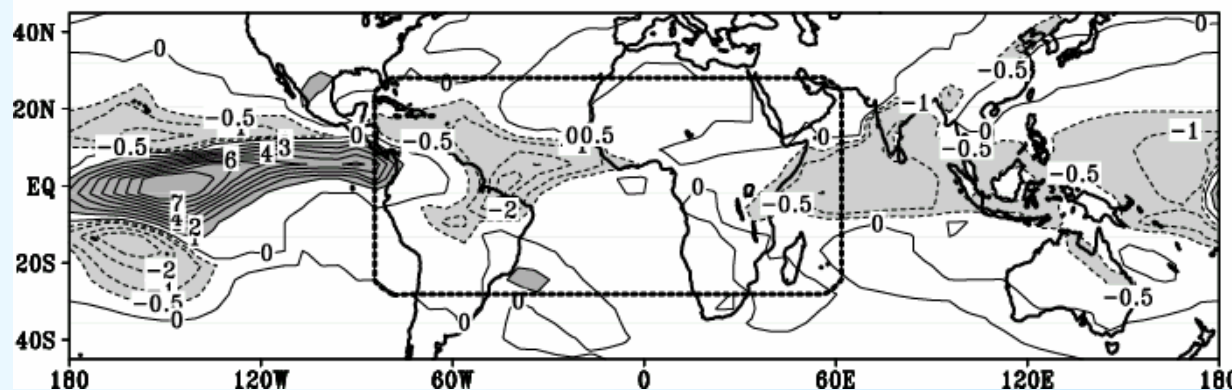
$(\mathbf{v} \cdot \nabla T)'$

$(\text{surface stress})'$

(a) Precip. JASON 1997 POSPAC\_CLIMRADT-CLIM



(a) Precip. JASON 1997 POSPAC\_CLIMGRDT-CLIM



(a) Precip. JASON 1997 POSPAC\_CLIMDRAG-CLIM

