Background and Questions:


2. Possible delayed effect of ENSO
   - Stratospheric warming response lags the maximum Niño3.4 value for several months (García-Herrera et al. 2006);
   - Maximum correlation between ENSO and EP flux divergence at 30hPa appears when ENSO leads the EP flux by about three seasons (Chen et al. 2003).

3. The known delayed effect of ENSO in the troposphere Response of zonal-mean tropical temperature lags the ENSO peak by 1-2 seasons (Newell and Weare 1976; Angell 1981; Reid et al. 1989; Yulaeva and Wallace 1994), due to the tropical oceans delayed response to ENSO (Kumar and Hoerling 2003) and via the “atmospheric bridge”, (Lau and Nath 2003; Klein et al. 1999) and PNA-like teleconnection (Handoh et al. 2006).

4. Is a Lagged ENSO-PVO relationship existed? How?

Summary and Conclusion:

1. Significant lagged relationship between ENSO and PVO exists in 3-5 year timescale. Maximum response of PVO is in the next winter after ENSO peak.

2. The global mass circulation strengthens during Warm ENSO, exhibiting poleward and downward propagation.

3. Planetary wave-1/wave-2 in the concurrent/next winter following ENSO.

4. Warm and positive mass anomalies persists in the midlatitude stratosphere from the preceding to the following summer following warm ENSO.