Surface signature of the QBO cycle

Interannual variability: NAM, ENSO, trends

Roberta Quadrelli and Mike Wallace

University of Washington, Seattle
Summary

• QBO as a combination of 2 modes:
  
  ✴ Every winter classified
  ✴ Projection on surface modes
  ✴ Linear signature on SLP- SAT:
    → ~10% of winter mean SLP variance
    → "Intrasessional" features
NAM and TRENDS

Contours every 10 m (left); Contours every 4 m per 10 yrs (right).
Contours every 10 m
SLP PC1−30hPa PC1 WARM WINTER CORRELATION

$r=0.89, 99.6\%$
NAM, ENSO and TRENDS

Contours every 10 m (left); Contours every 4 m per 10 yrs (right).
SLP and SAT WINTER TRENDS 58-99: WARM vs. COLD ENSO YEARS

SLP contours every 0.5hPa per 10 yrs; SAT contours every 0.2 degrees per 10yrs.
Summary

ENSO phases modulate:

* Vertical coherence of NAM
* Strength of observed linear trends
* Projection of trends onto NAM structure

Non-linear dynamics?
Impact on climate prediction