

# Evolution of Humidity and Convection Prior to MJO Onset and Their Sensitivities to Upper-Tropospheric Equatorial Wave Dynamics

Scott W. Powell

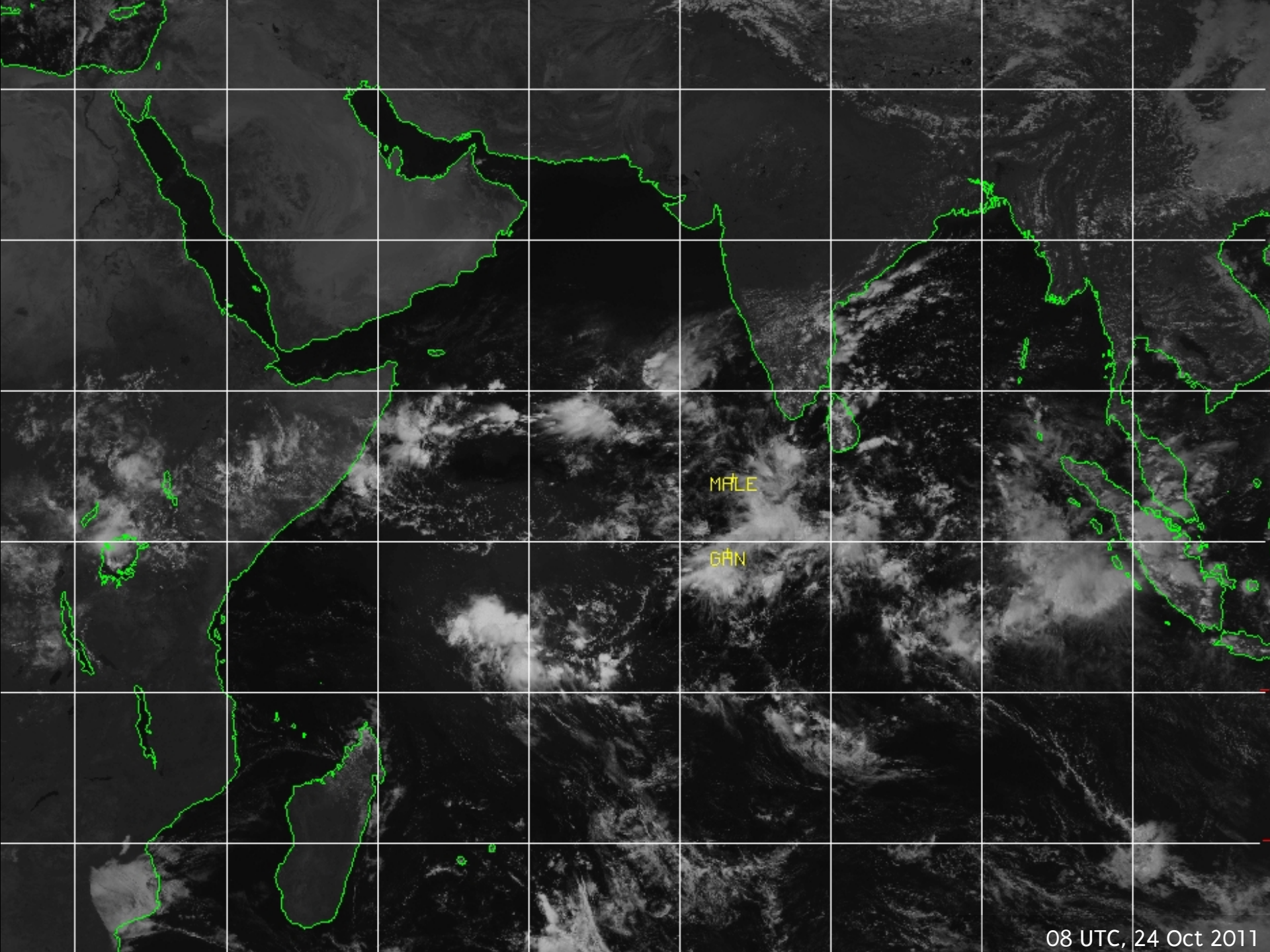
with R. A. Houze, Jr., *Univ. of Washington, Seattle*

1 April 2014

31<sup>st</sup> Conference on Hurricanes and Tropical Meteorology, San Diego

Supported by DOE grant DE-SC0006452 and NSF Grant AGS-1059611.

08 UTC, 24 Oct 2011

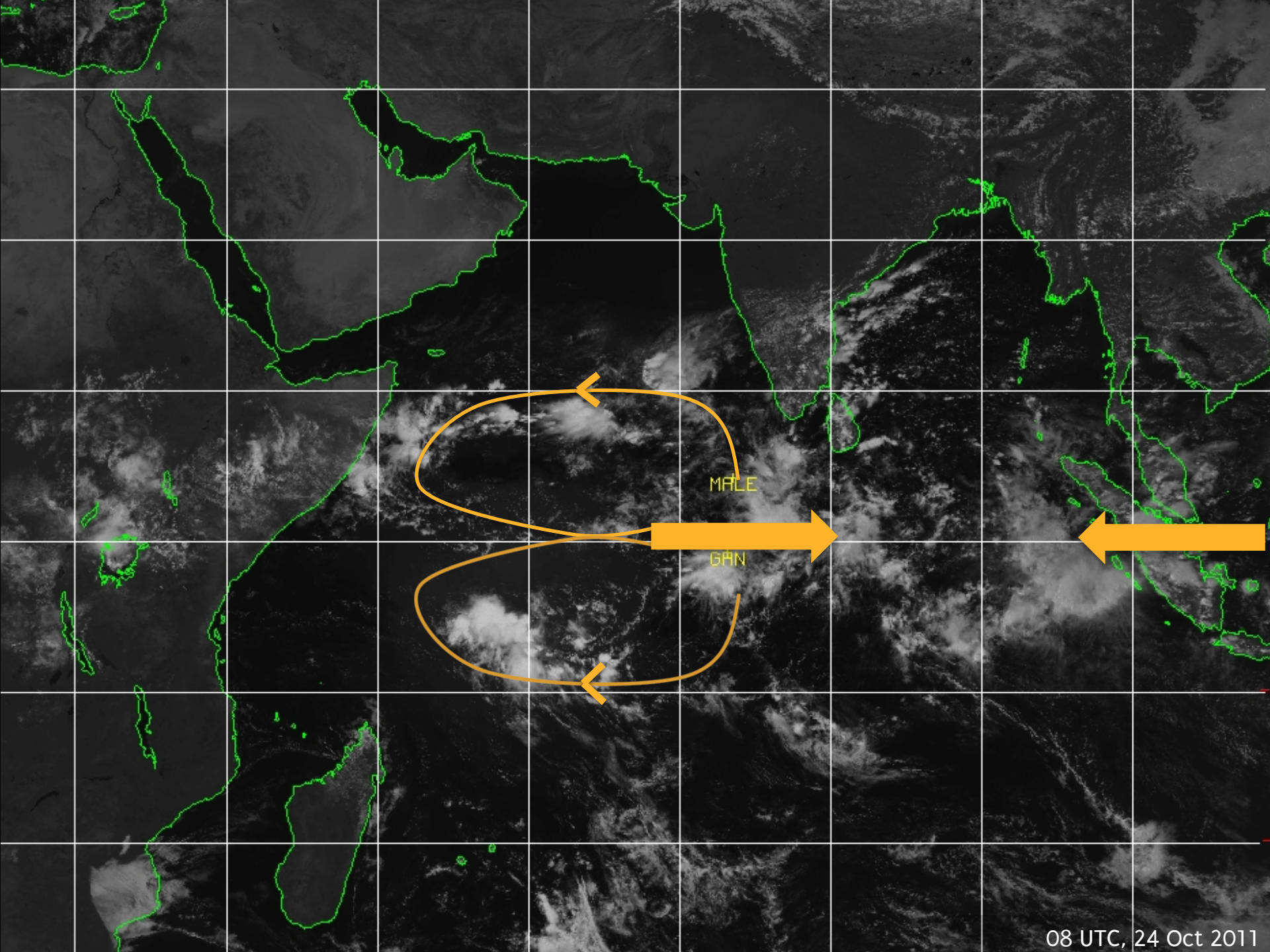


MALE

GPN

08 UTC, 24 Oct 2011



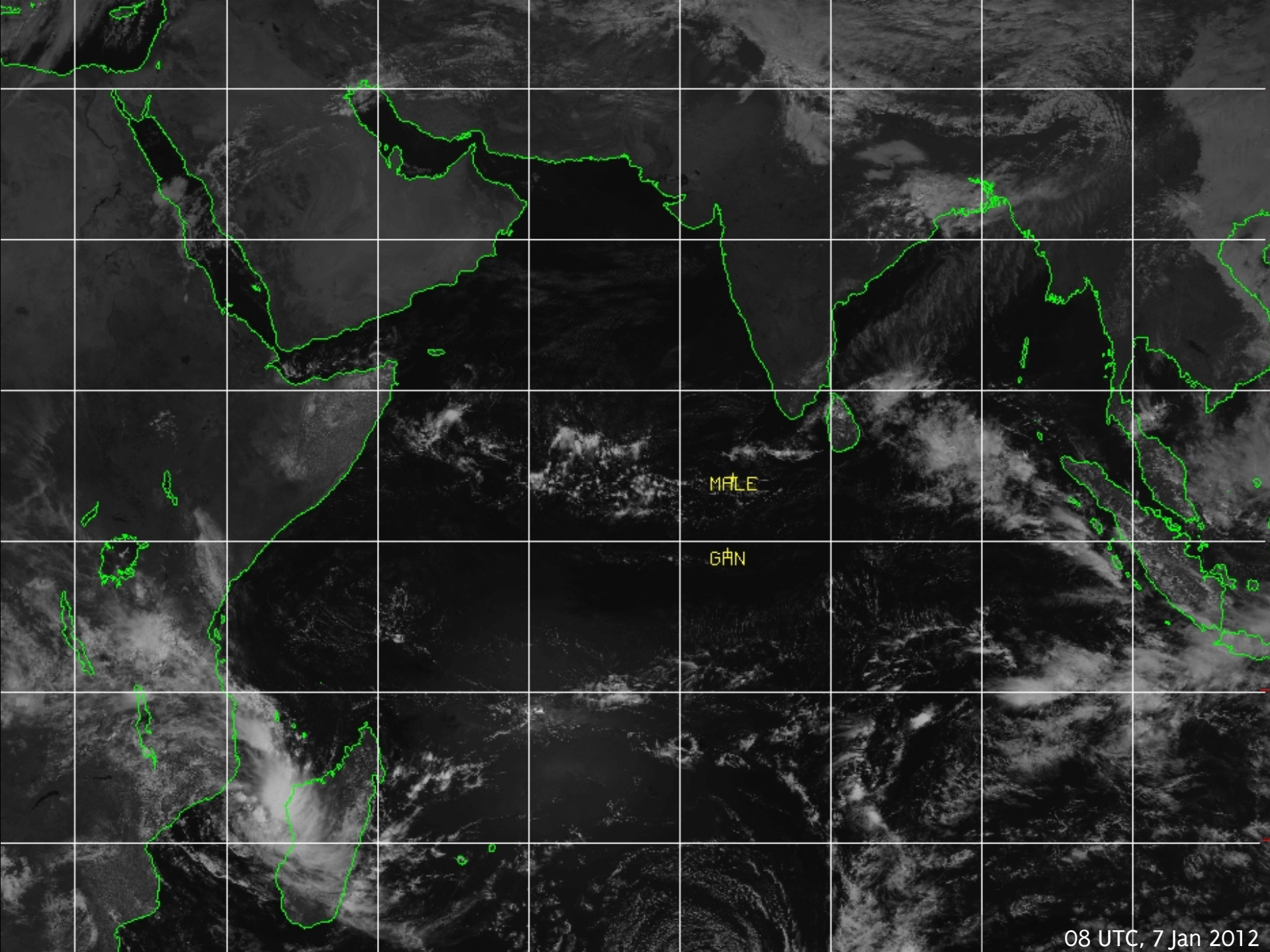


MALE

GPN

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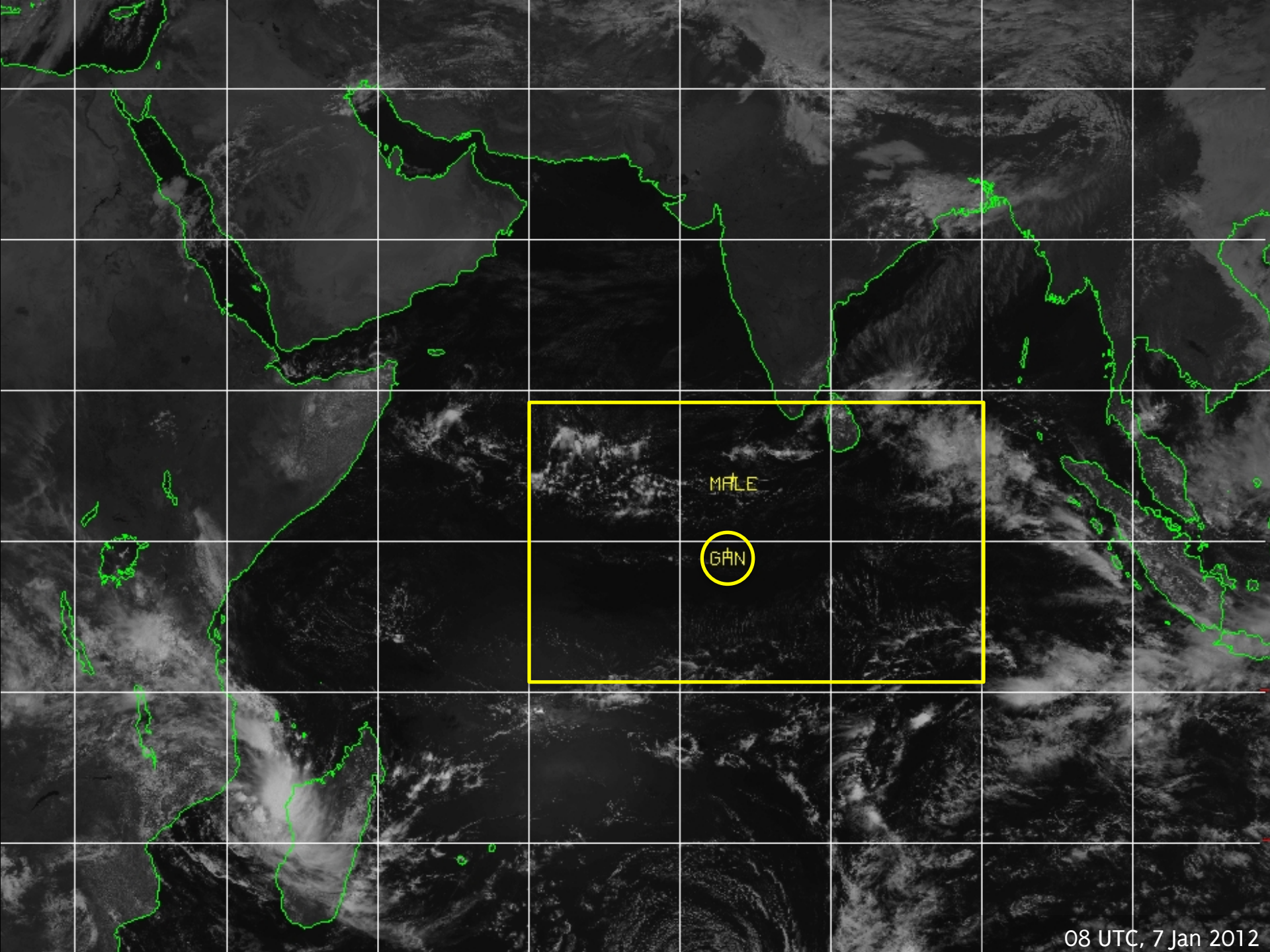


MALE

GPN

08 UTC, 7 Jan 2012

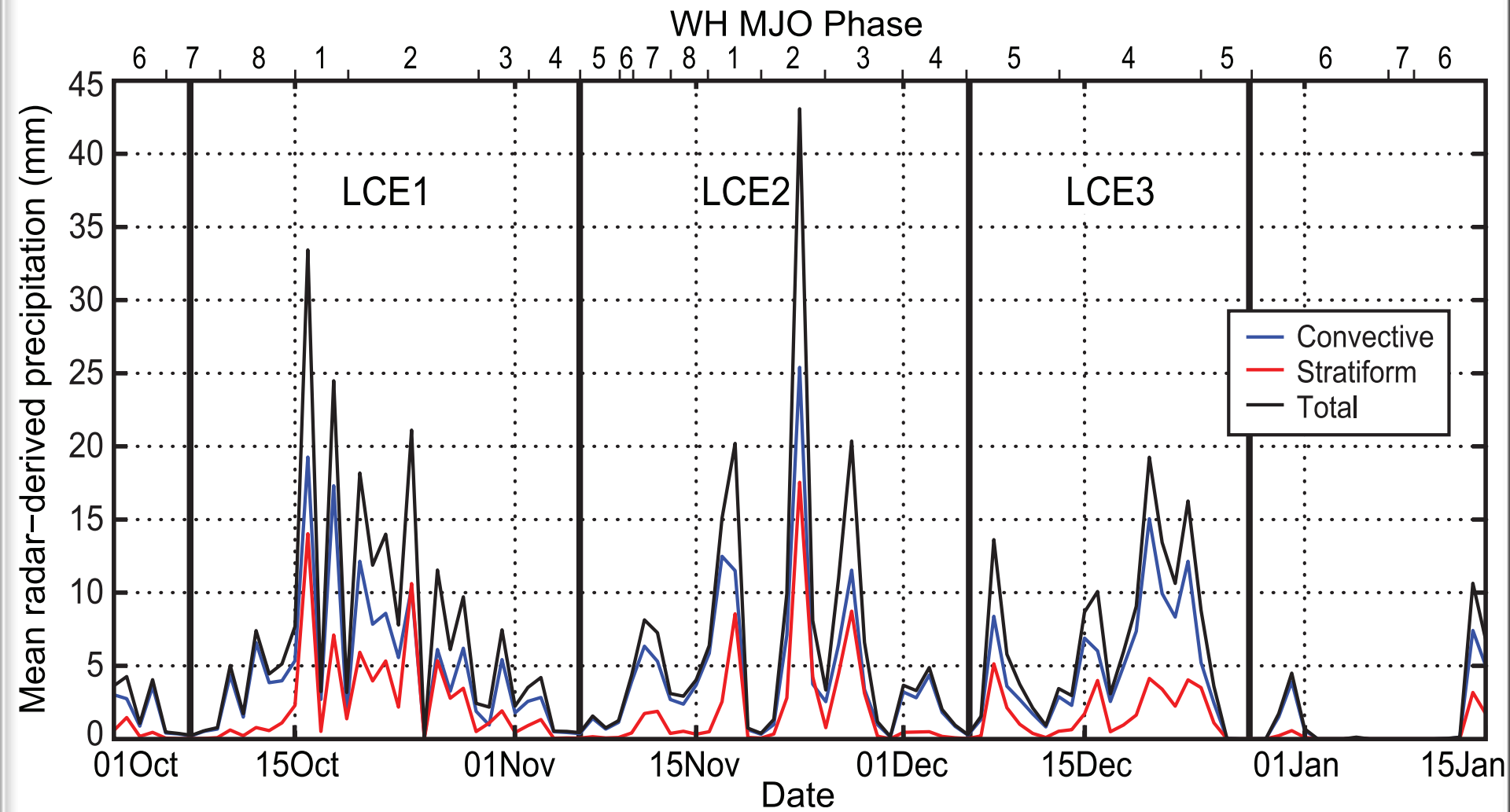




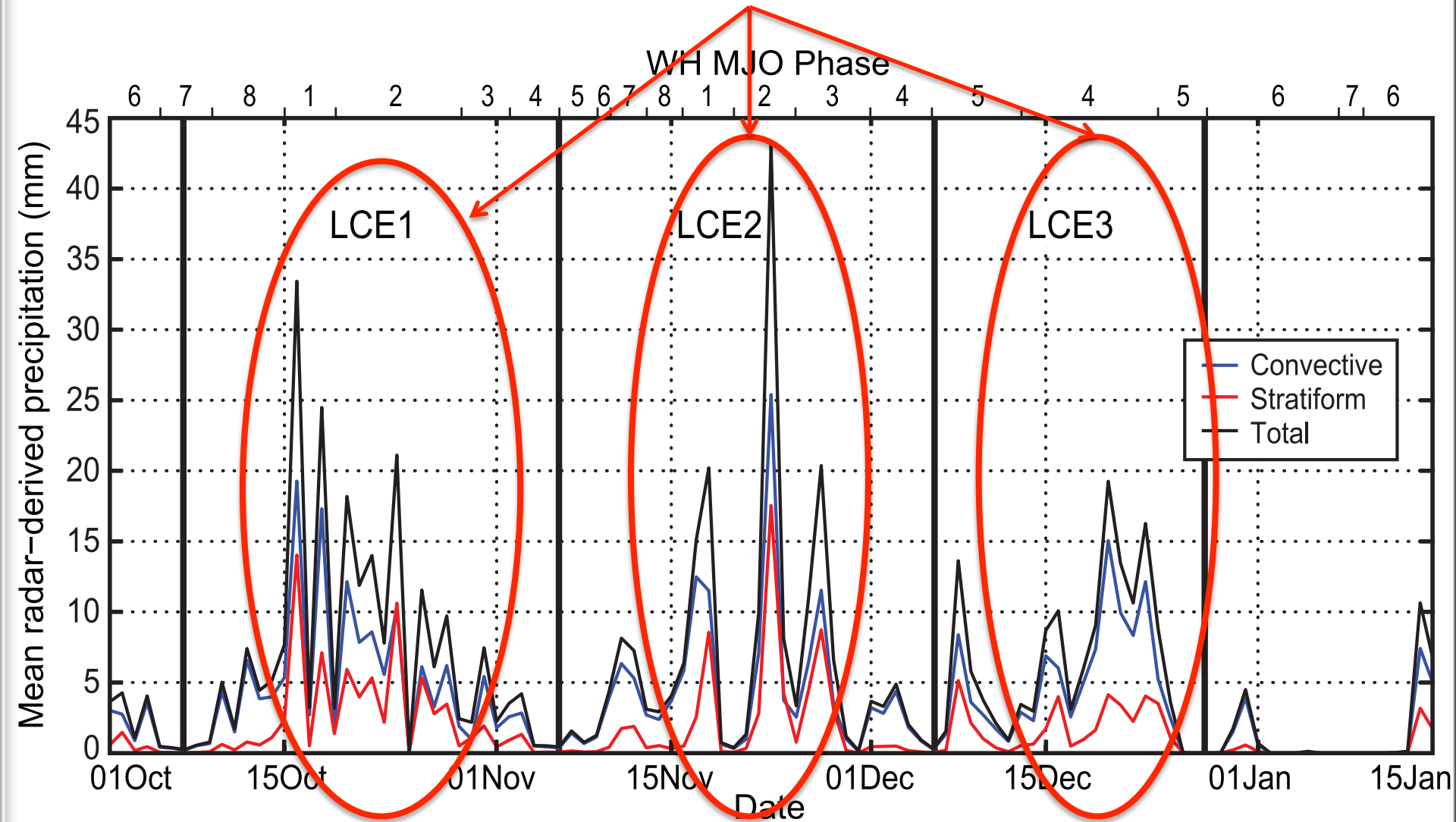
08 UTC, 7 Jan 2012

# *Evolution of Cloud Population and Humidity Fields*

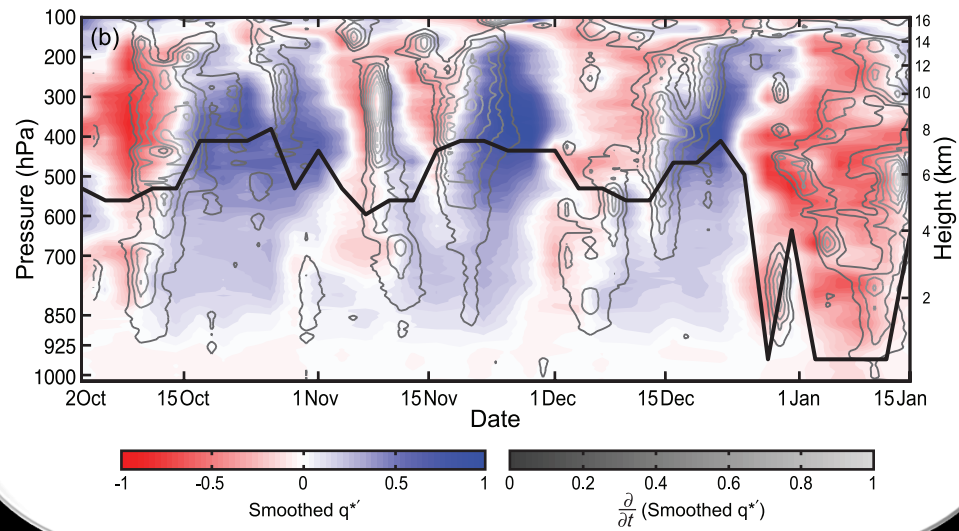
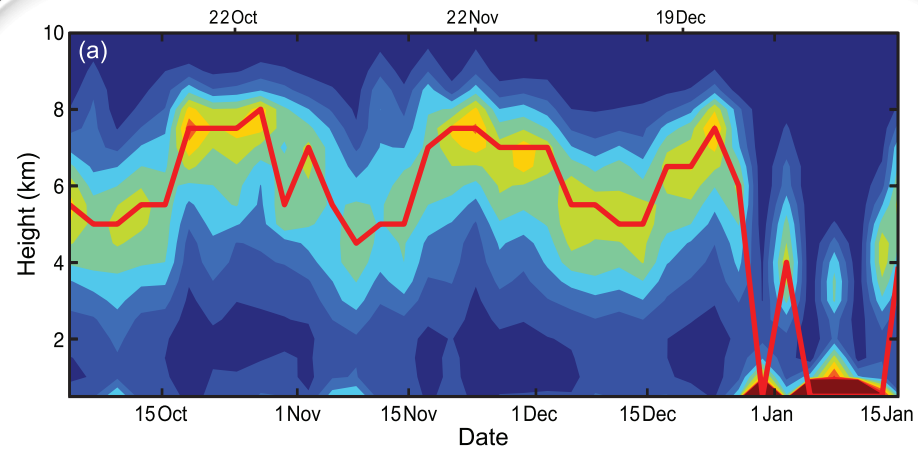


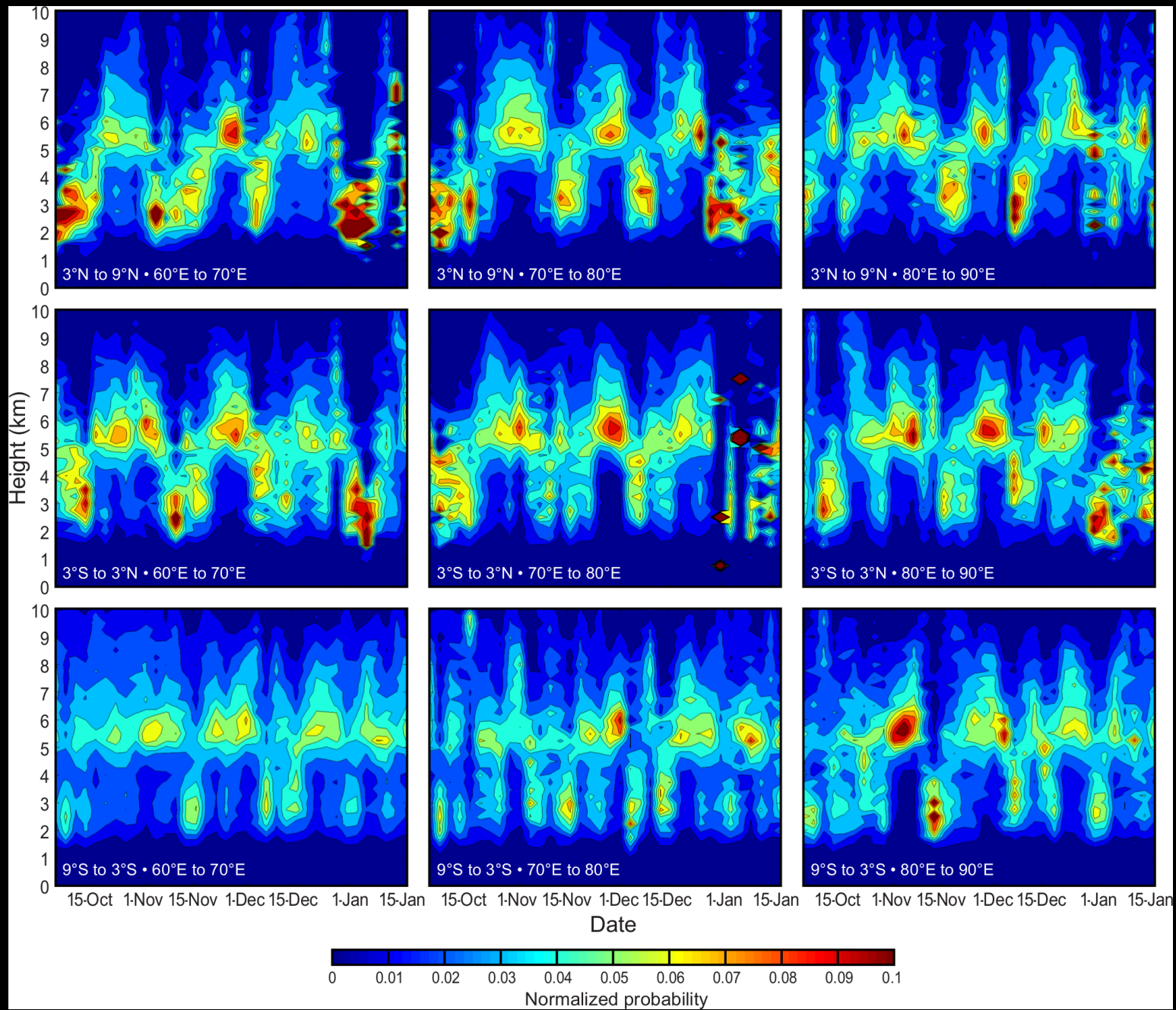


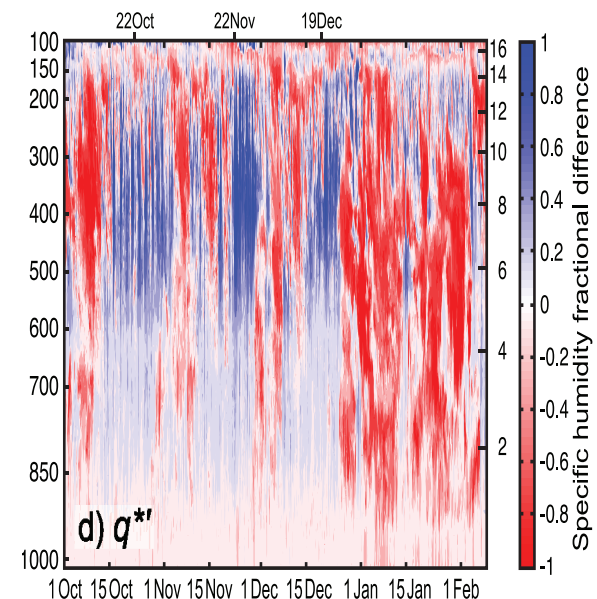
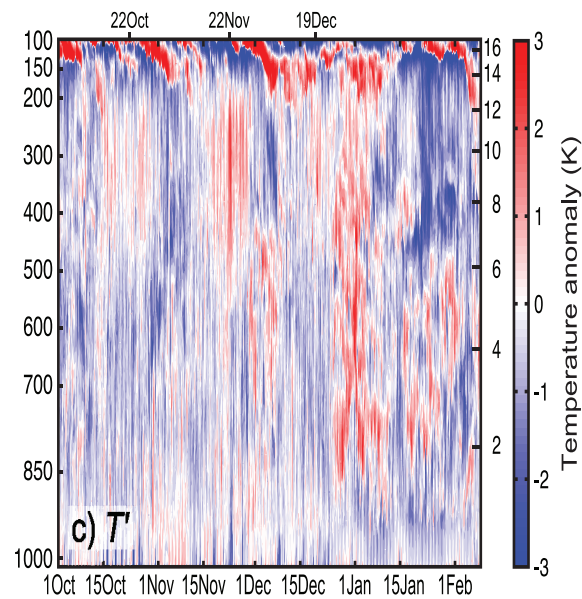
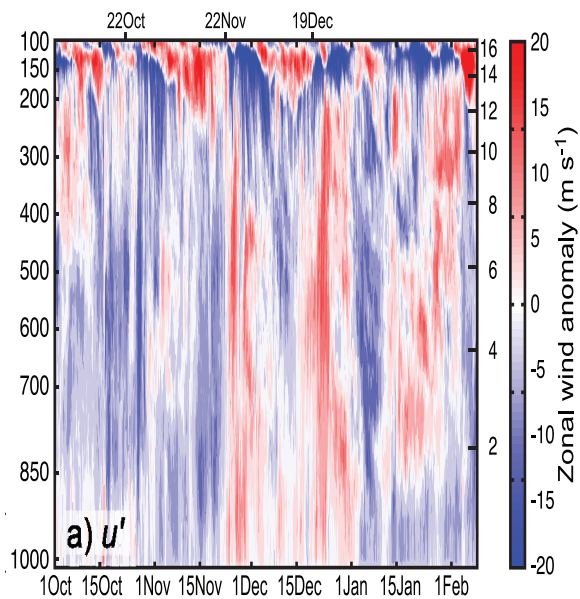
Gottschalck et al (2013), Powell and Houze (2013), Xu and Rutledge (2014)





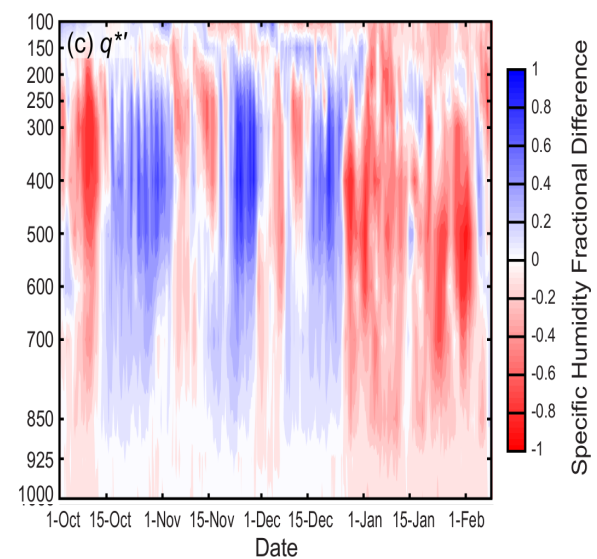
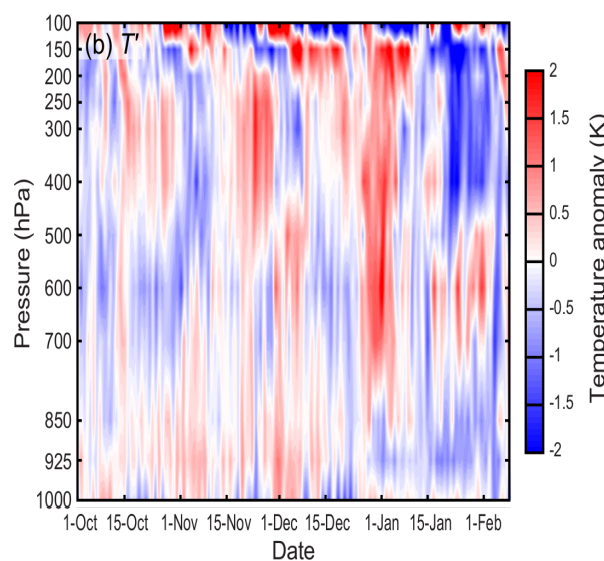
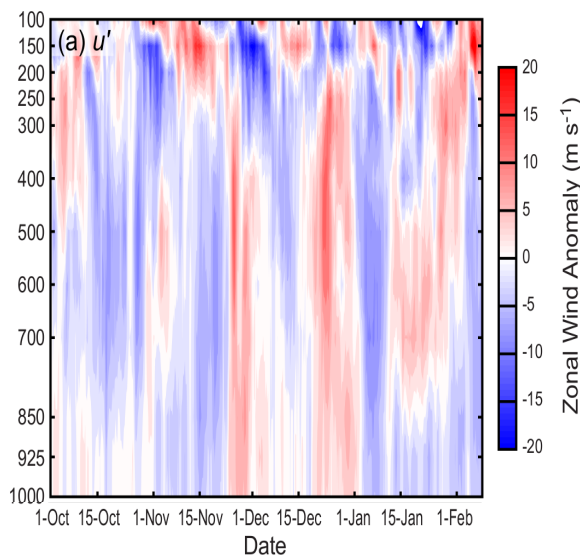






Top row: Gan rawinsonde data

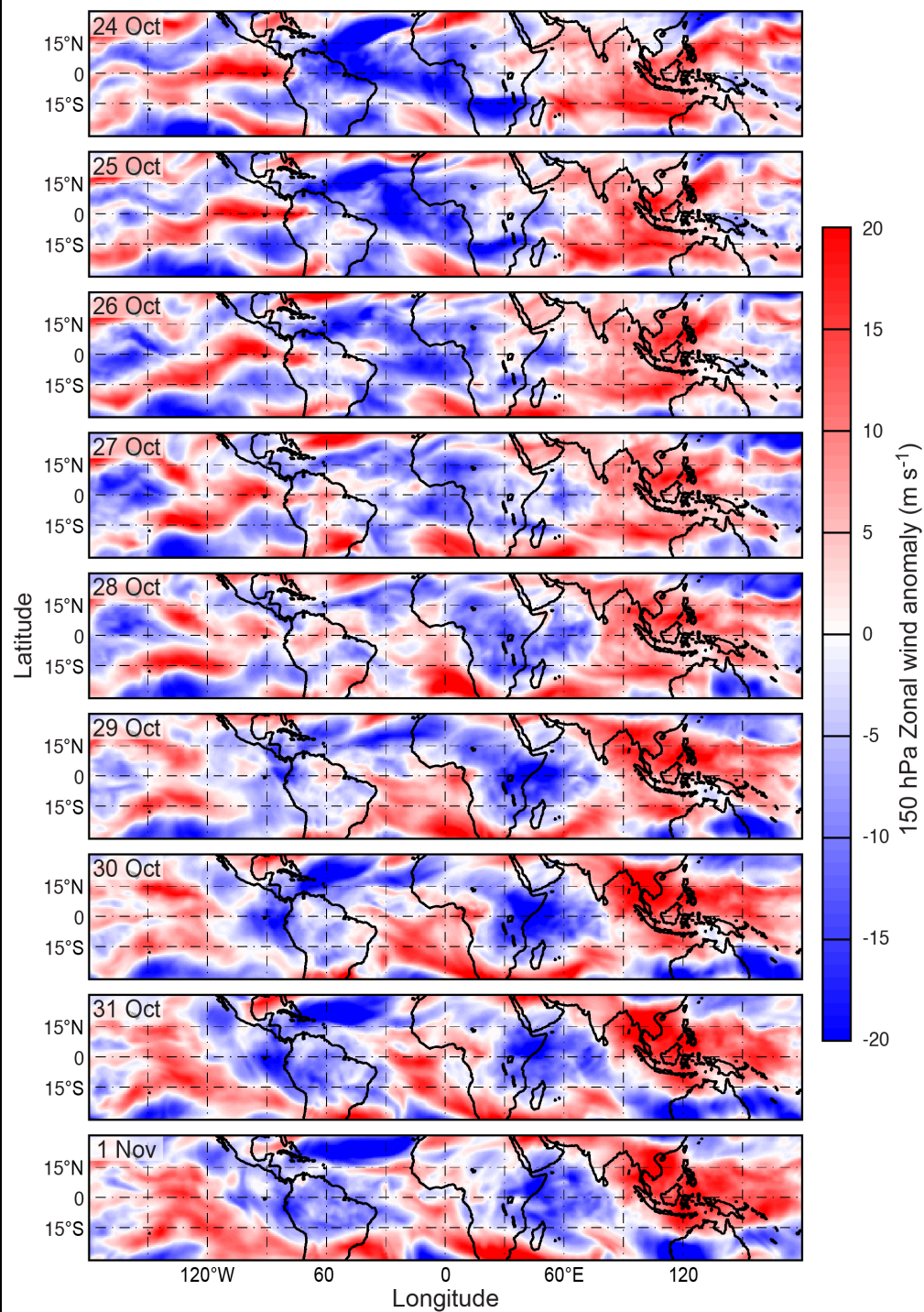
Bottom row: ERA-Interim ( $3^{\circ}\text{N} - 3^{\circ}\text{S}$ ,  $68^{\circ}\text{E} - 78^{\circ}\text{E}$ )



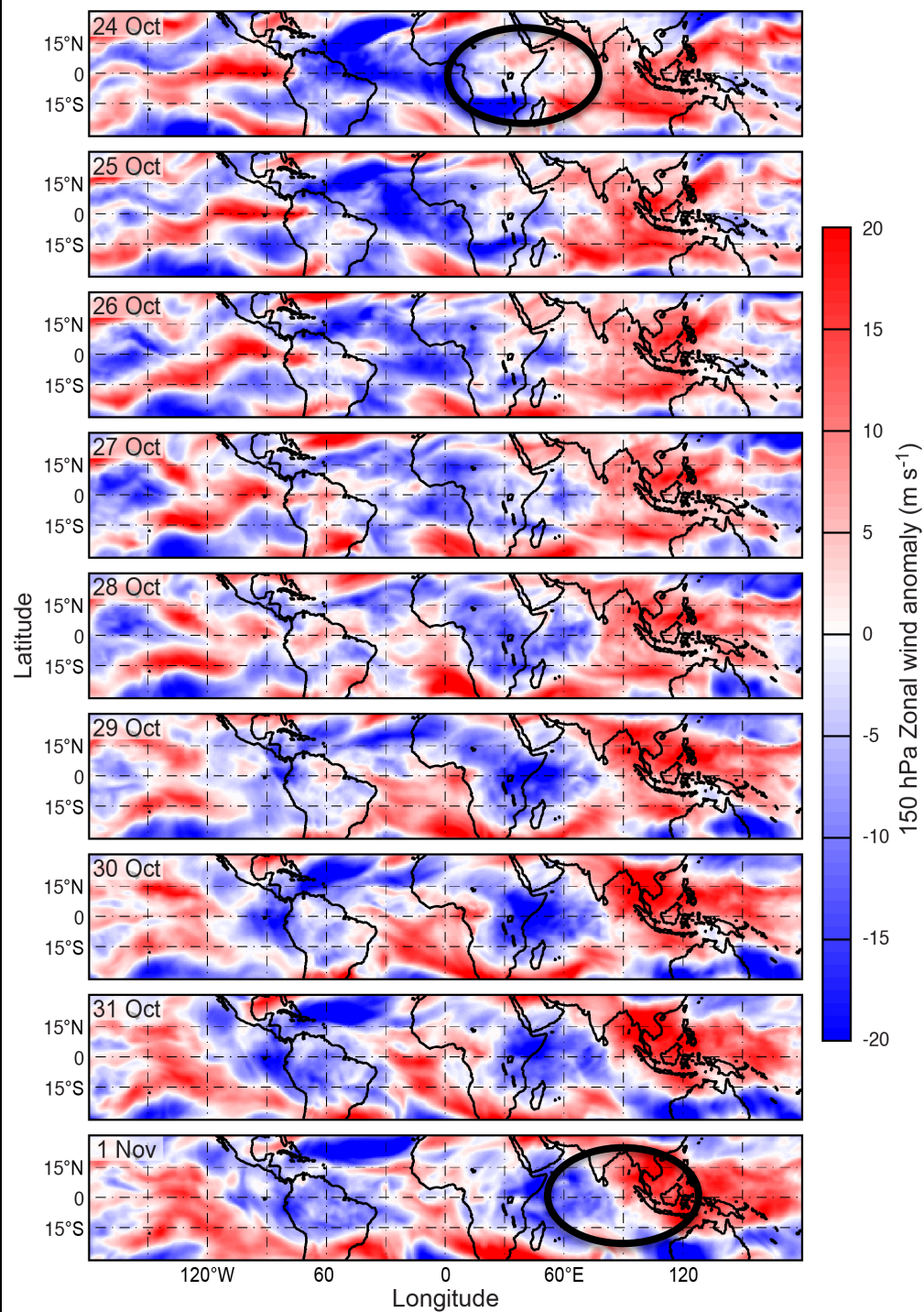


# *Upper-Tropospheric Dynamics*

150 hPa  $u'$   
Blue: Easterly  
Red: Westerly

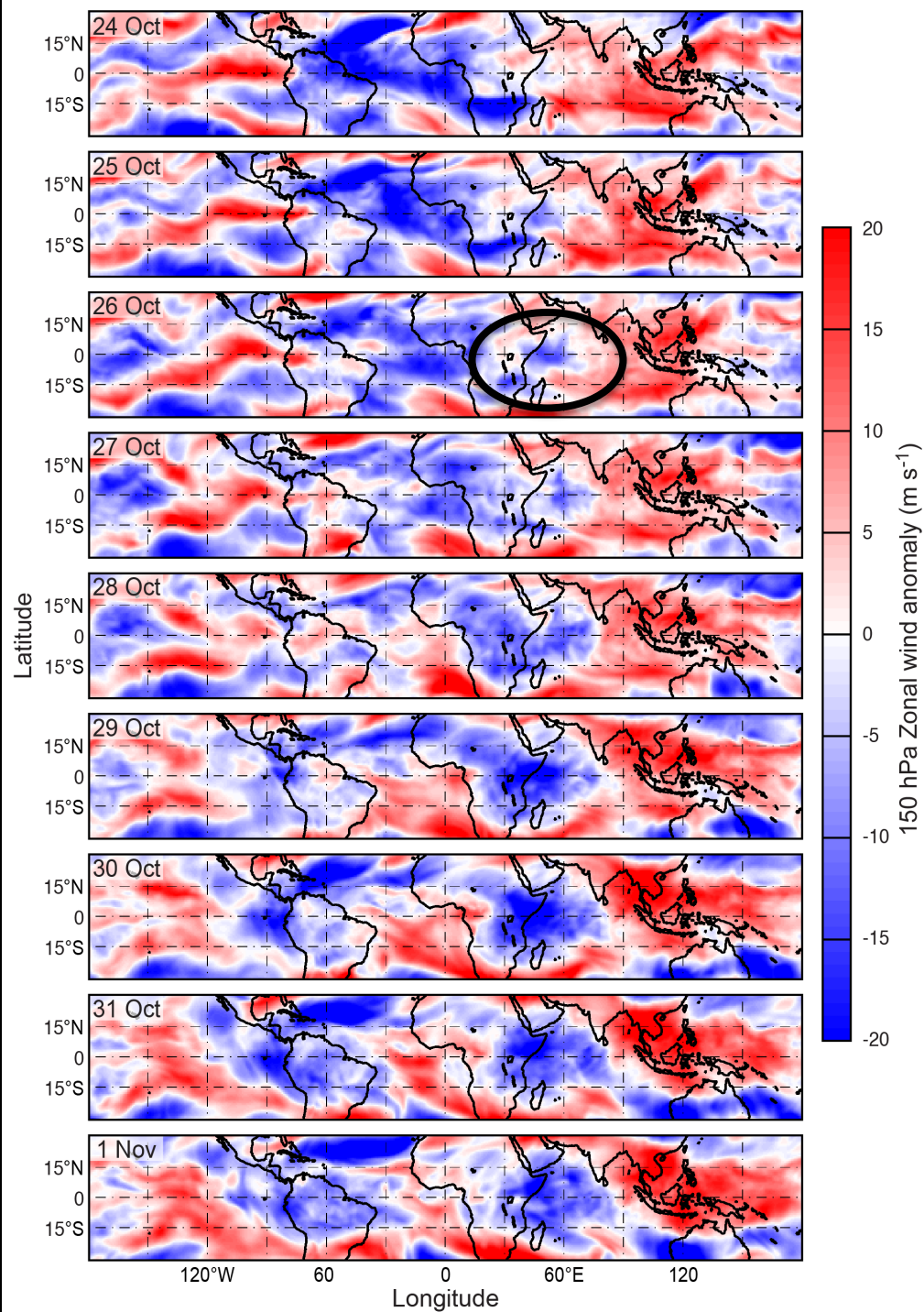


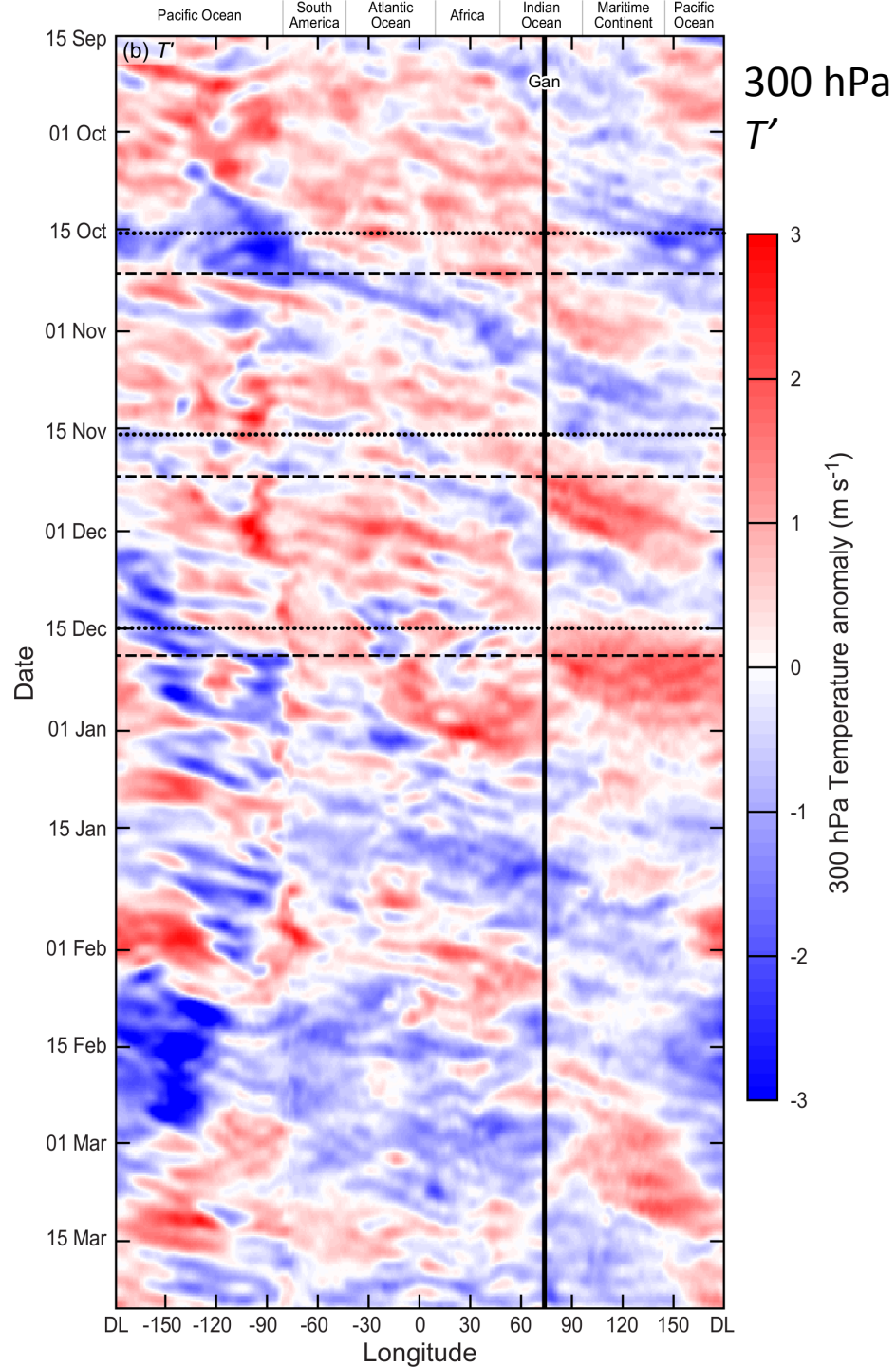
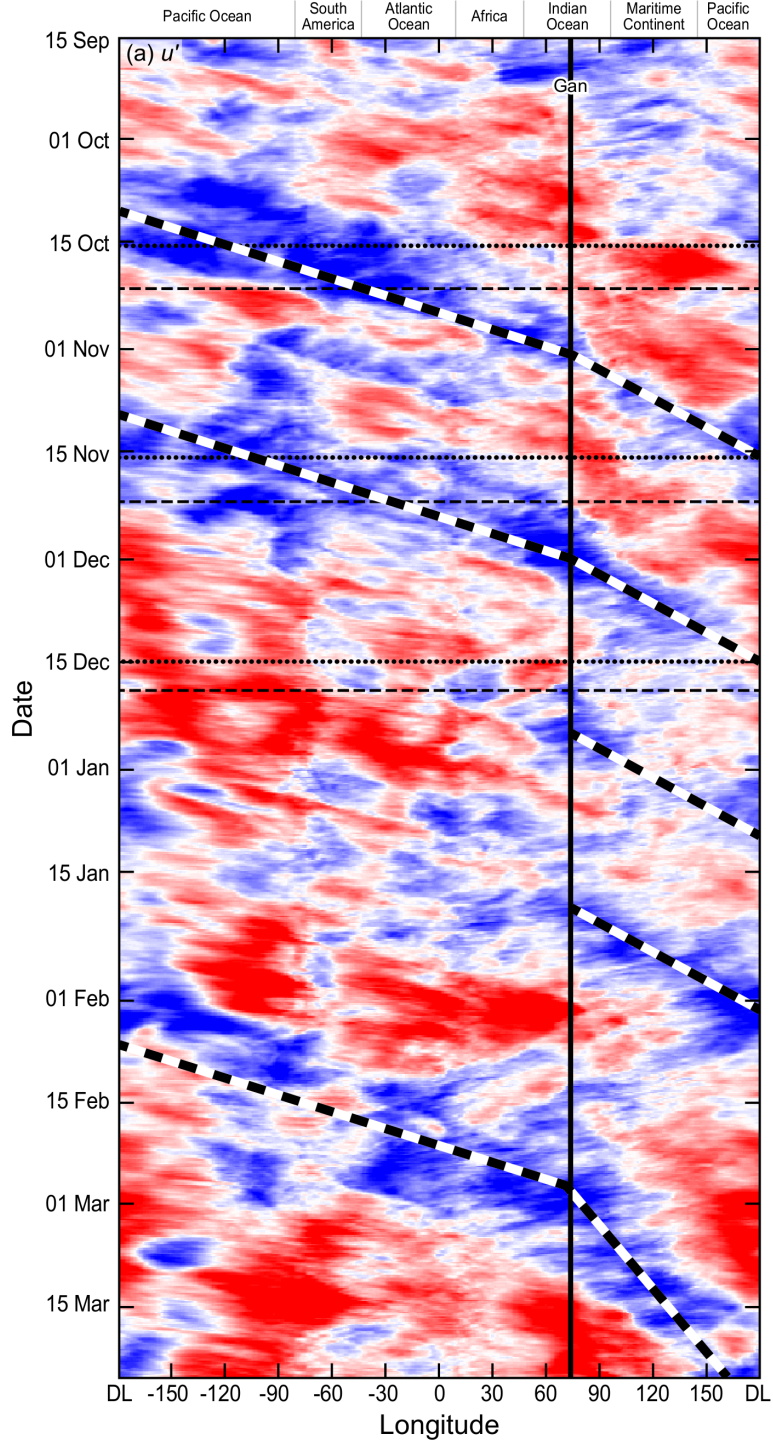
150 hPa  $u'$   
Blue: Easterly  
Red: Westerly



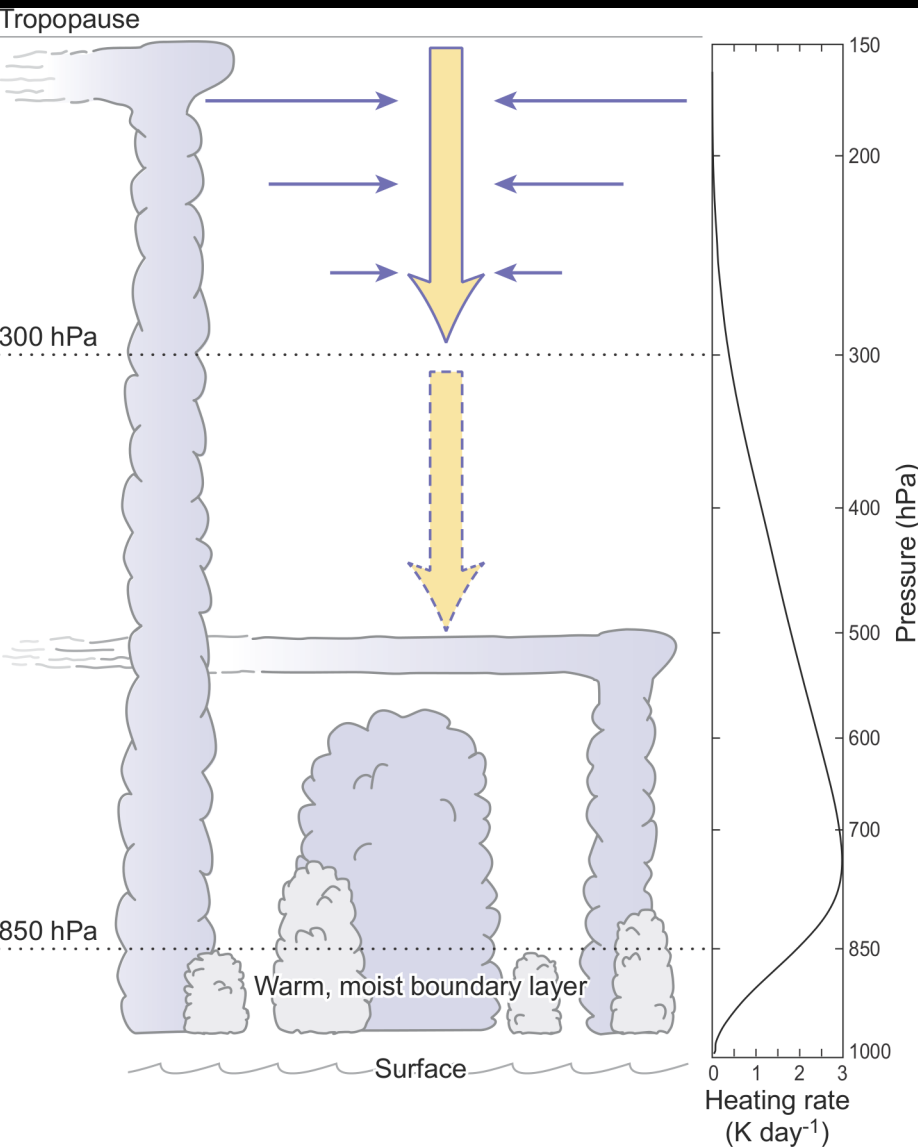


150 hPa  $u'$   
Blue: Easterly  
Red: Westerly

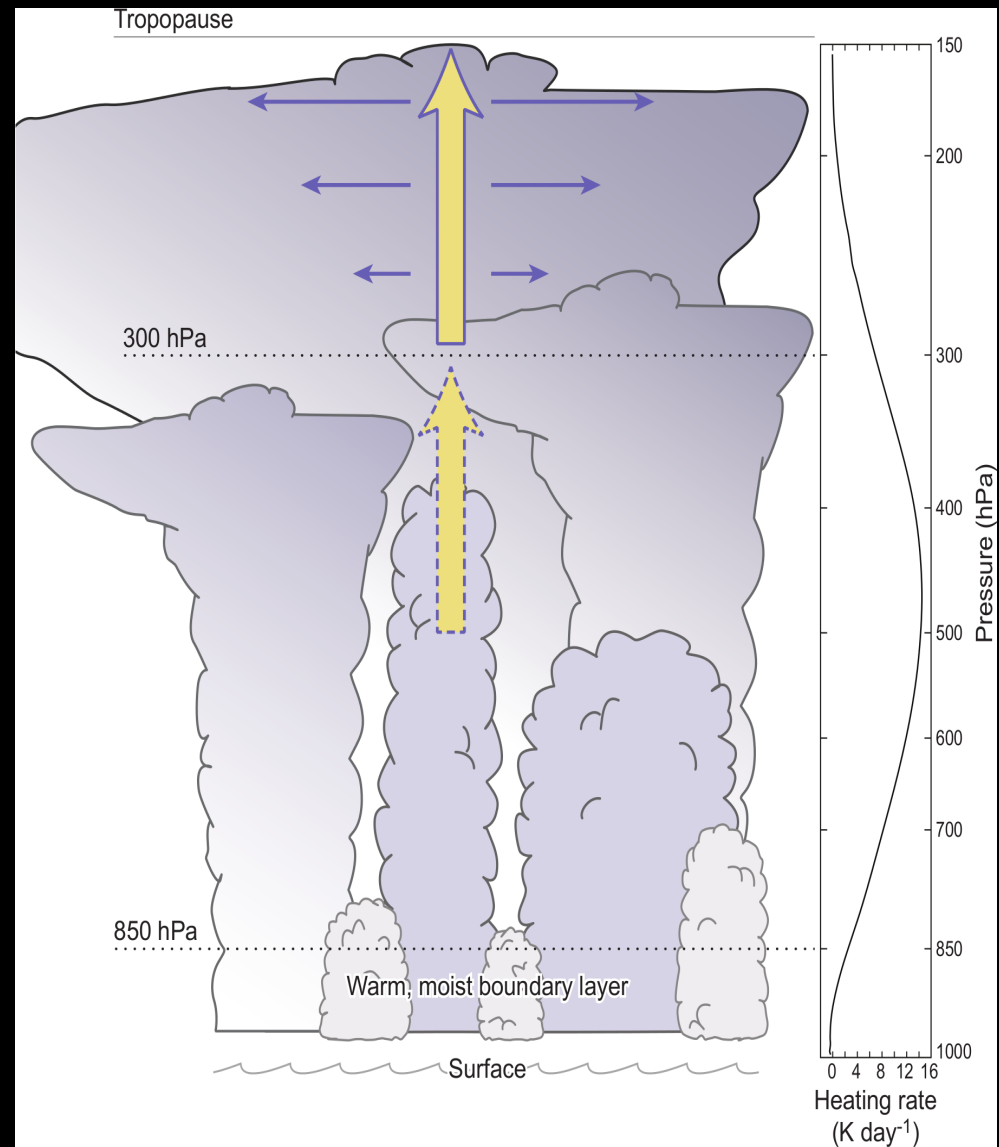




# Suppressed Convection



# Enhanced Convection





***End***