

Dry Large-Scale Vertical Motions and MJO Convective Onset

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Moistening by Cumulonimbi



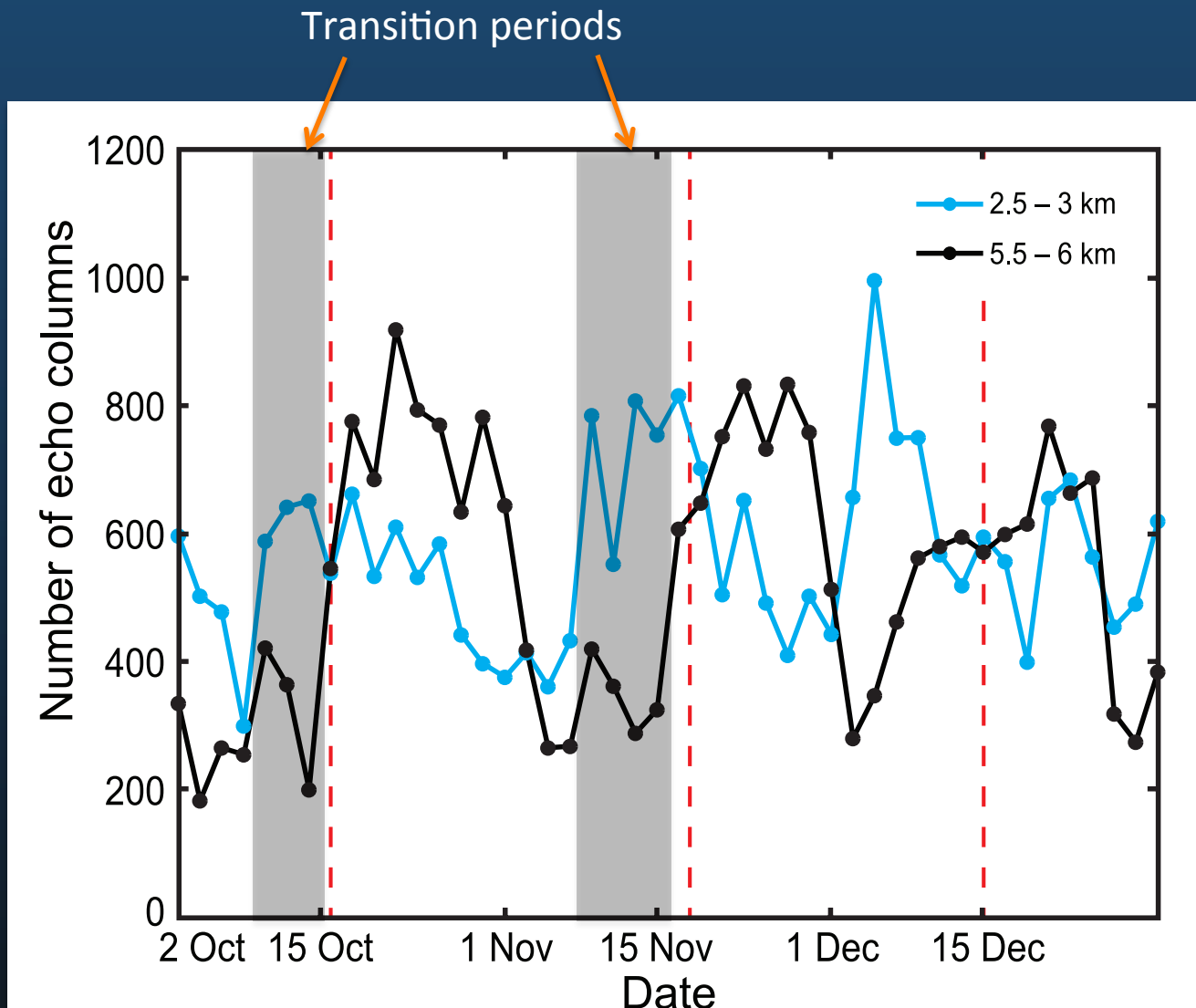
17 April 2015

Powell: Large-Scale Vertical Motion and
MJO Onset



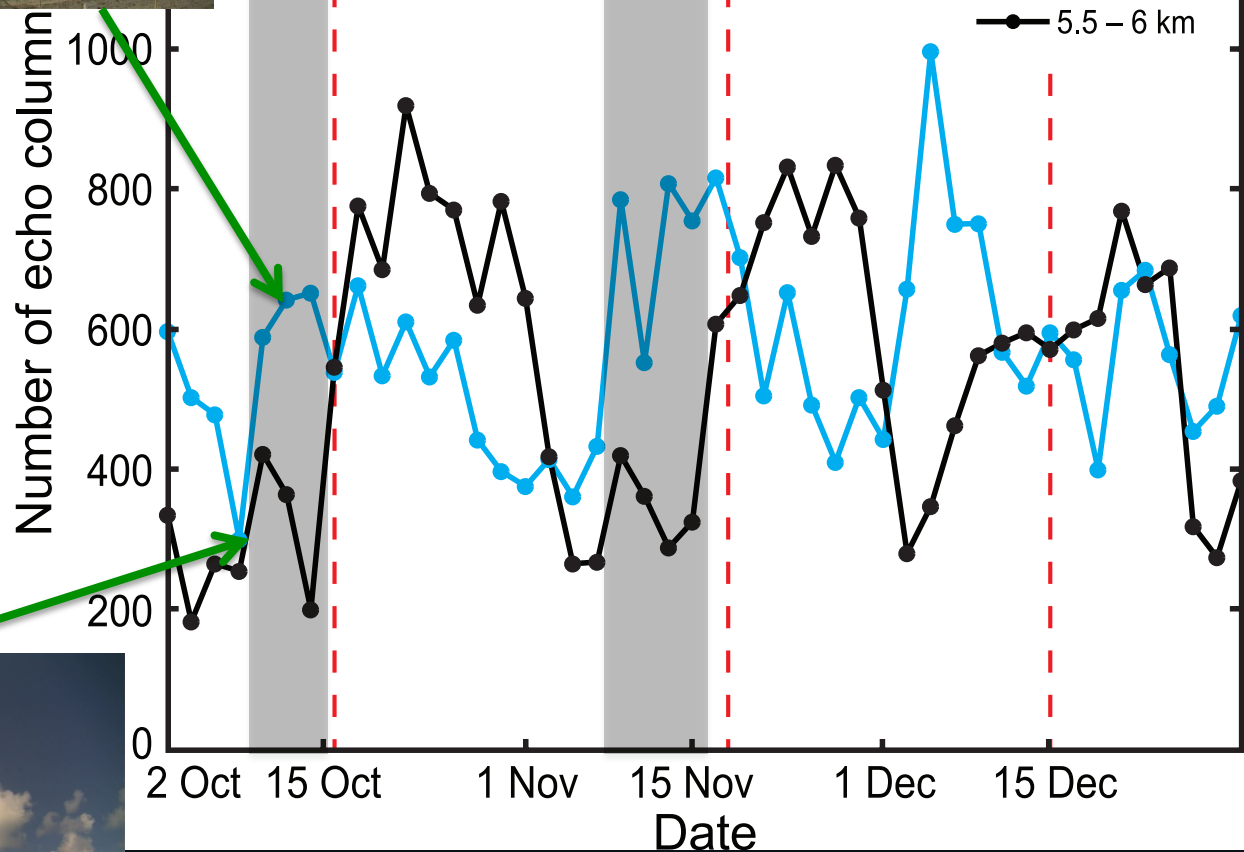
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Powell: Large-Scale Vertical Motion and
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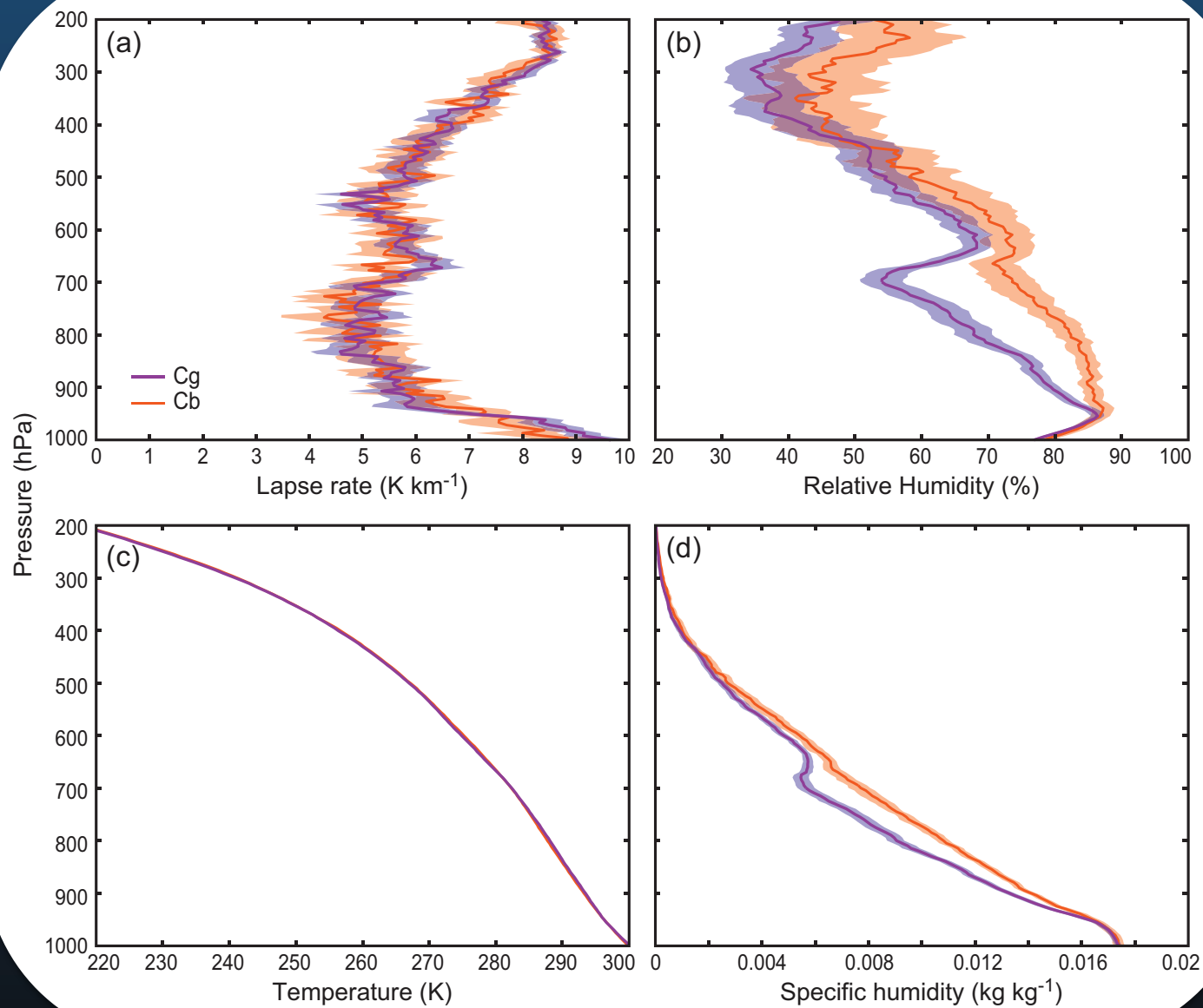


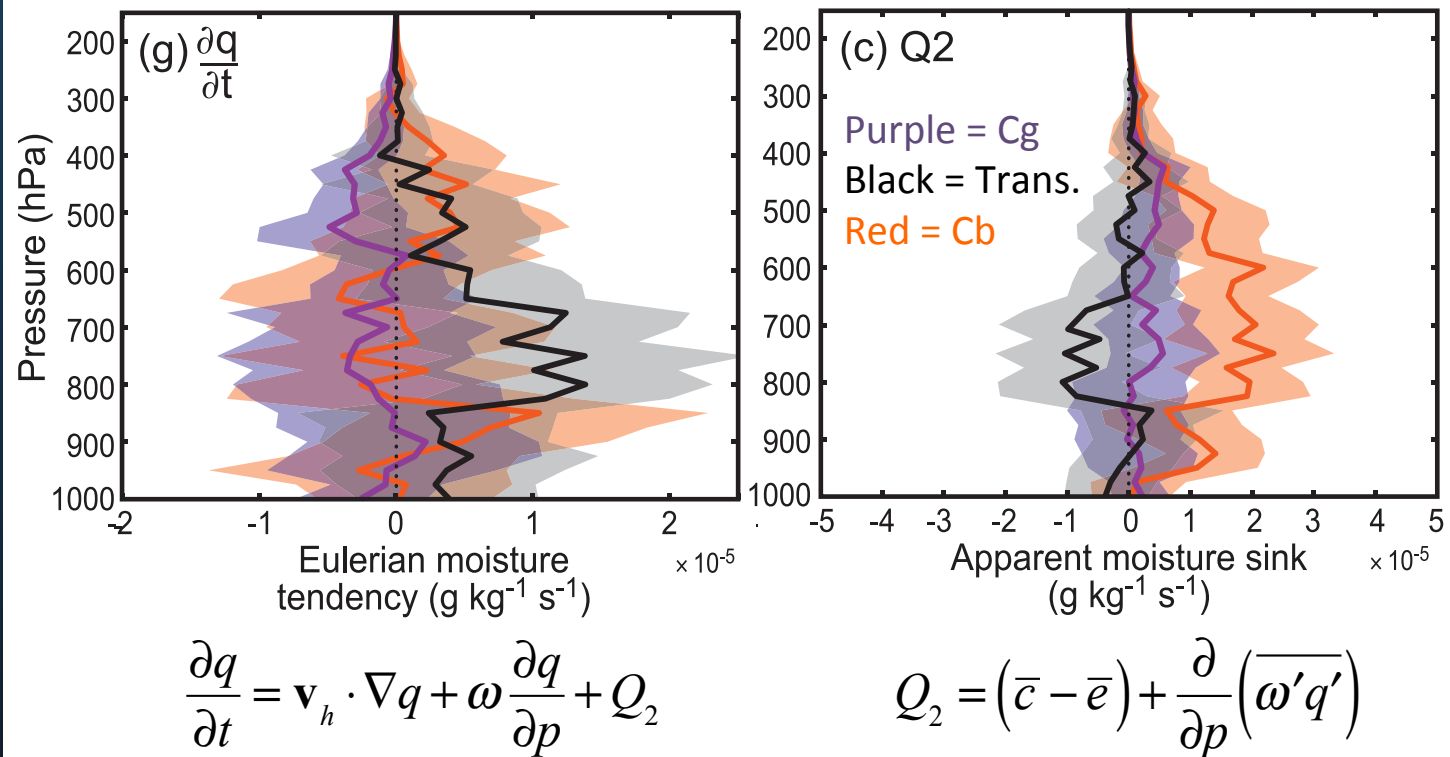
TRMM 20dBZ echo tops: 9N–9S; 60–100E

Transition periods



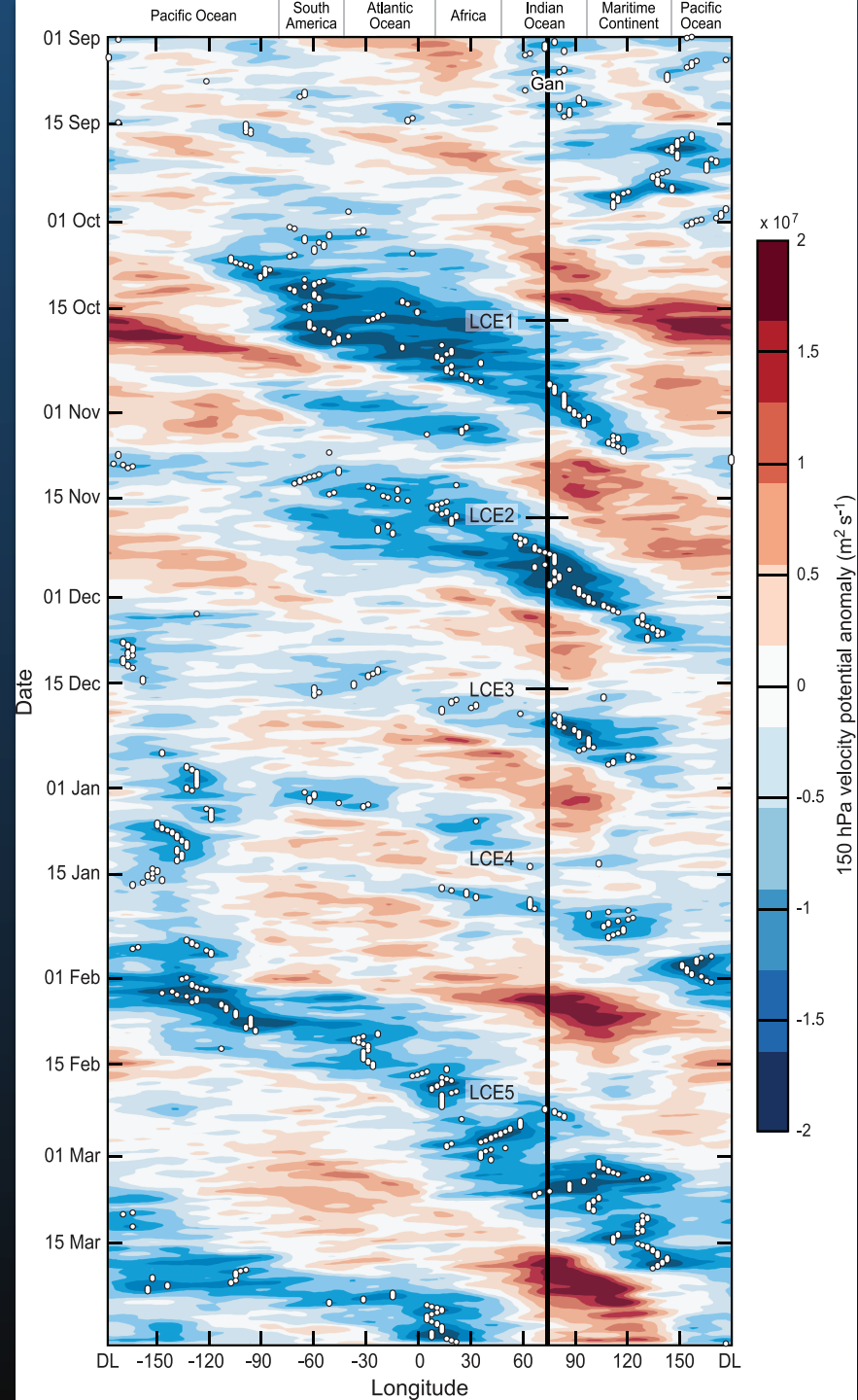
TRMM 20dBZ echo tops: 9N–9S; 60–100E

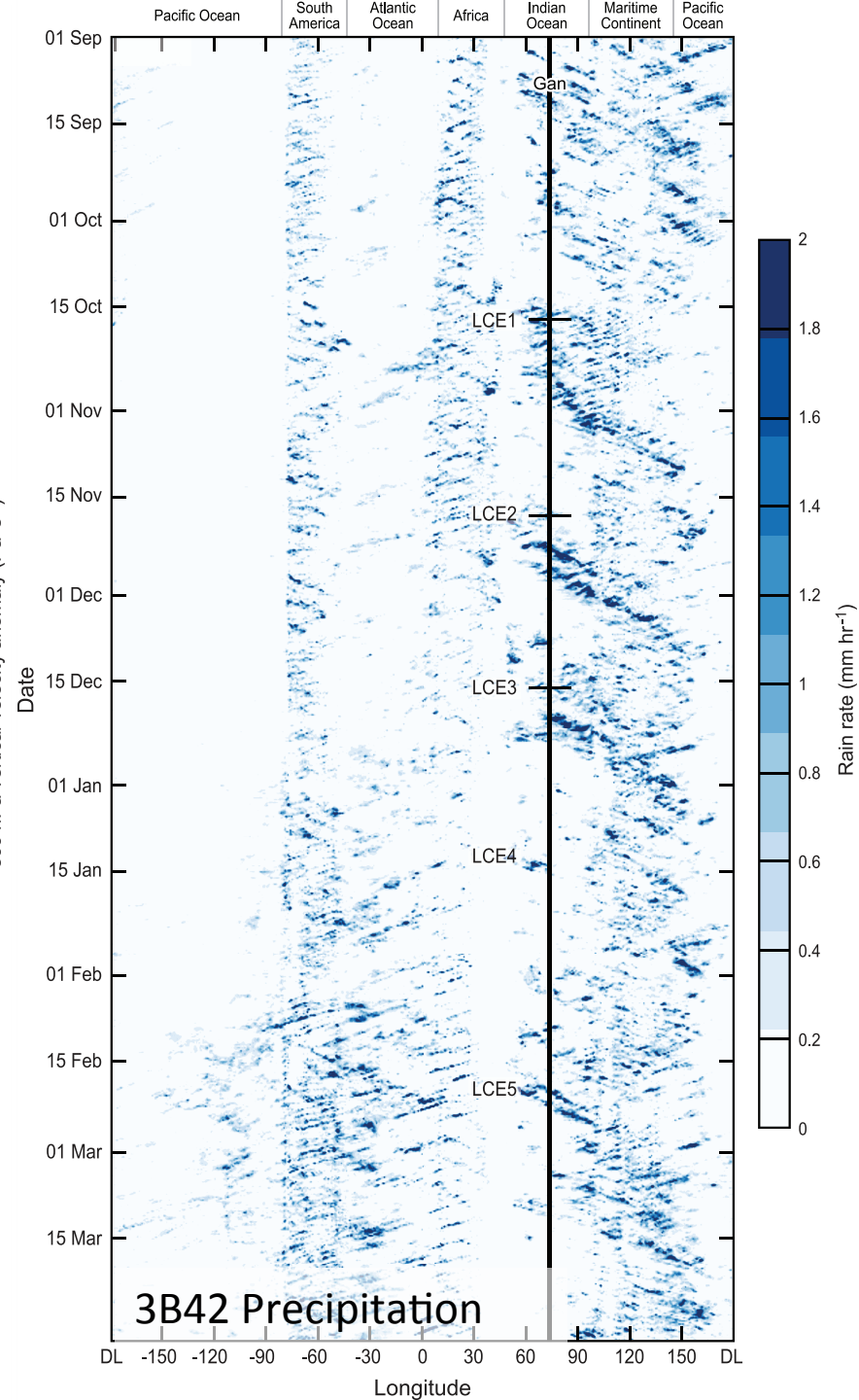
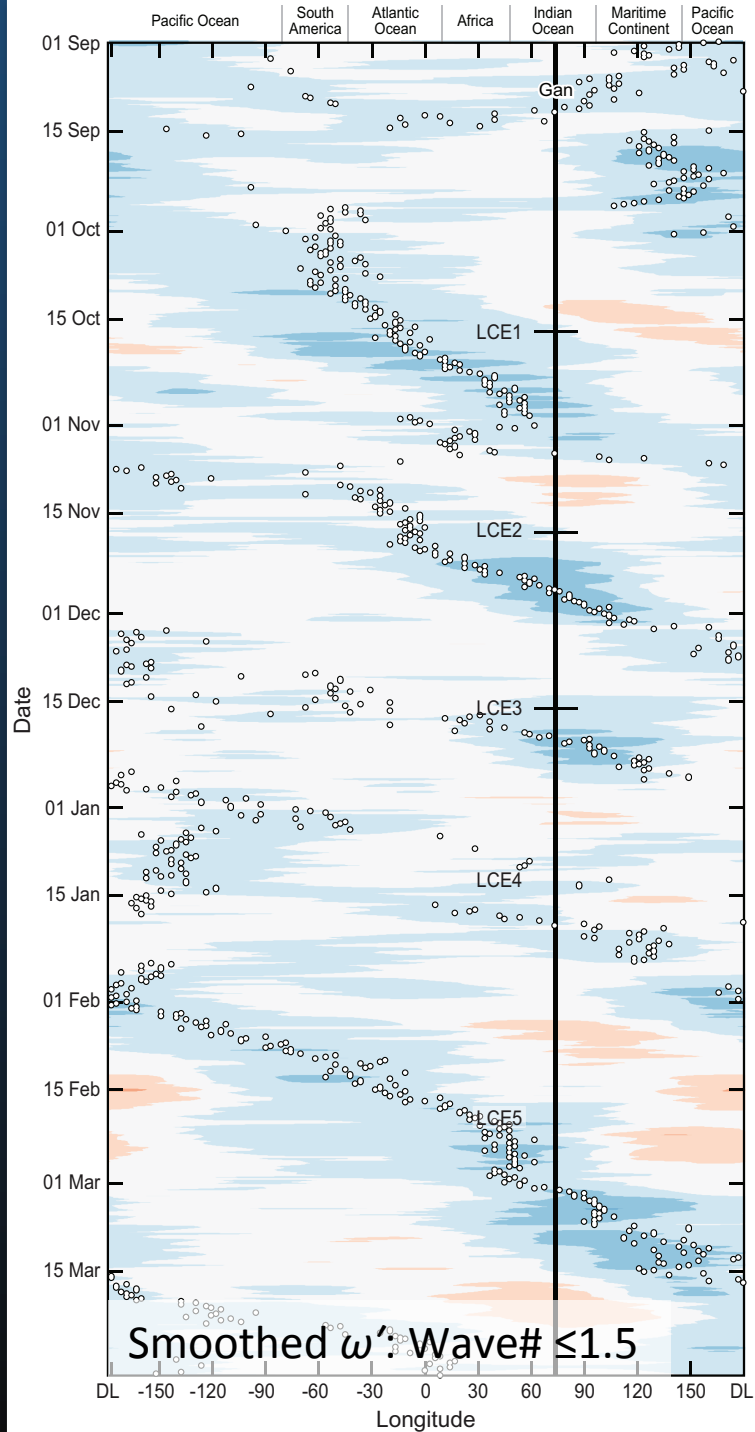


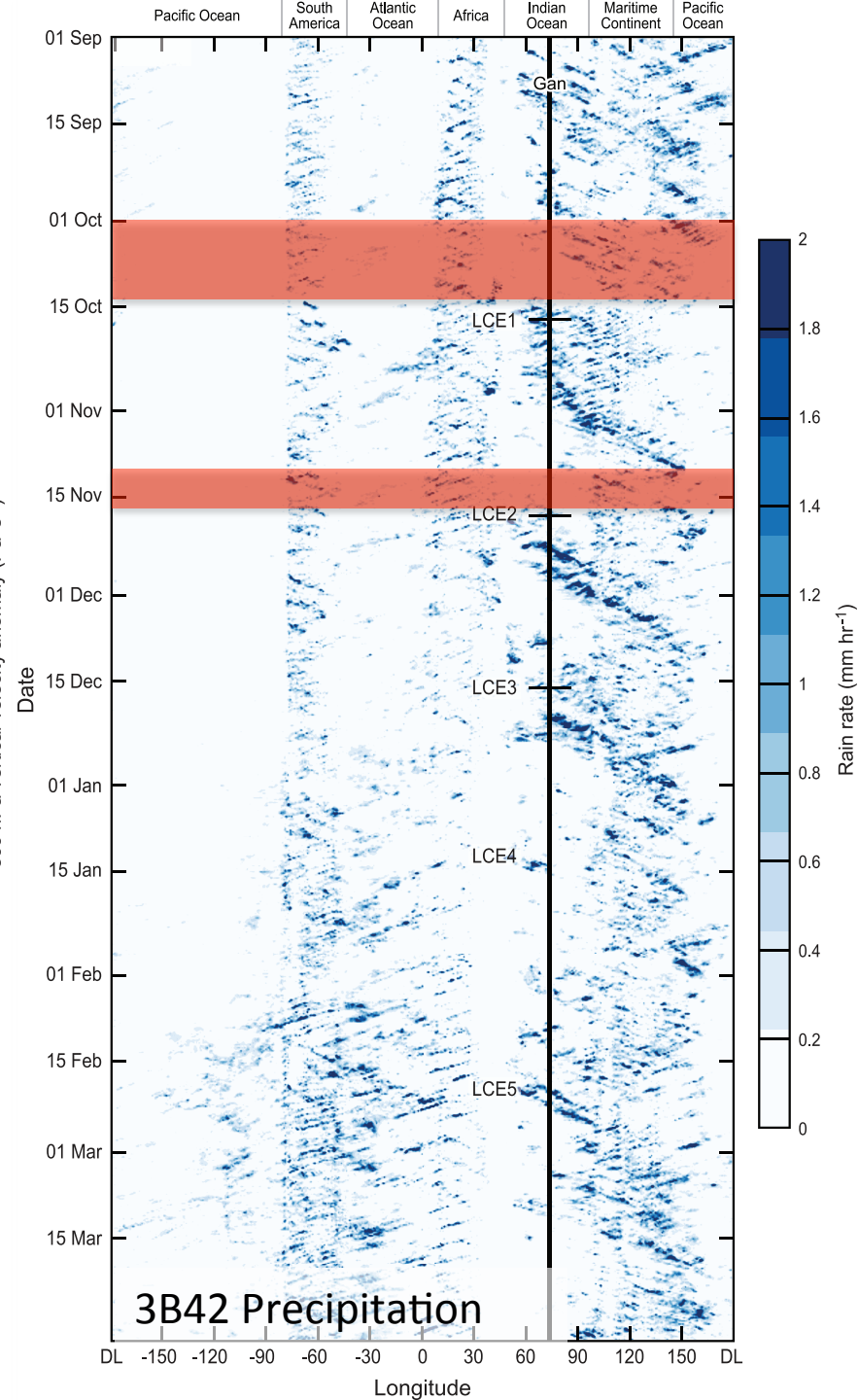
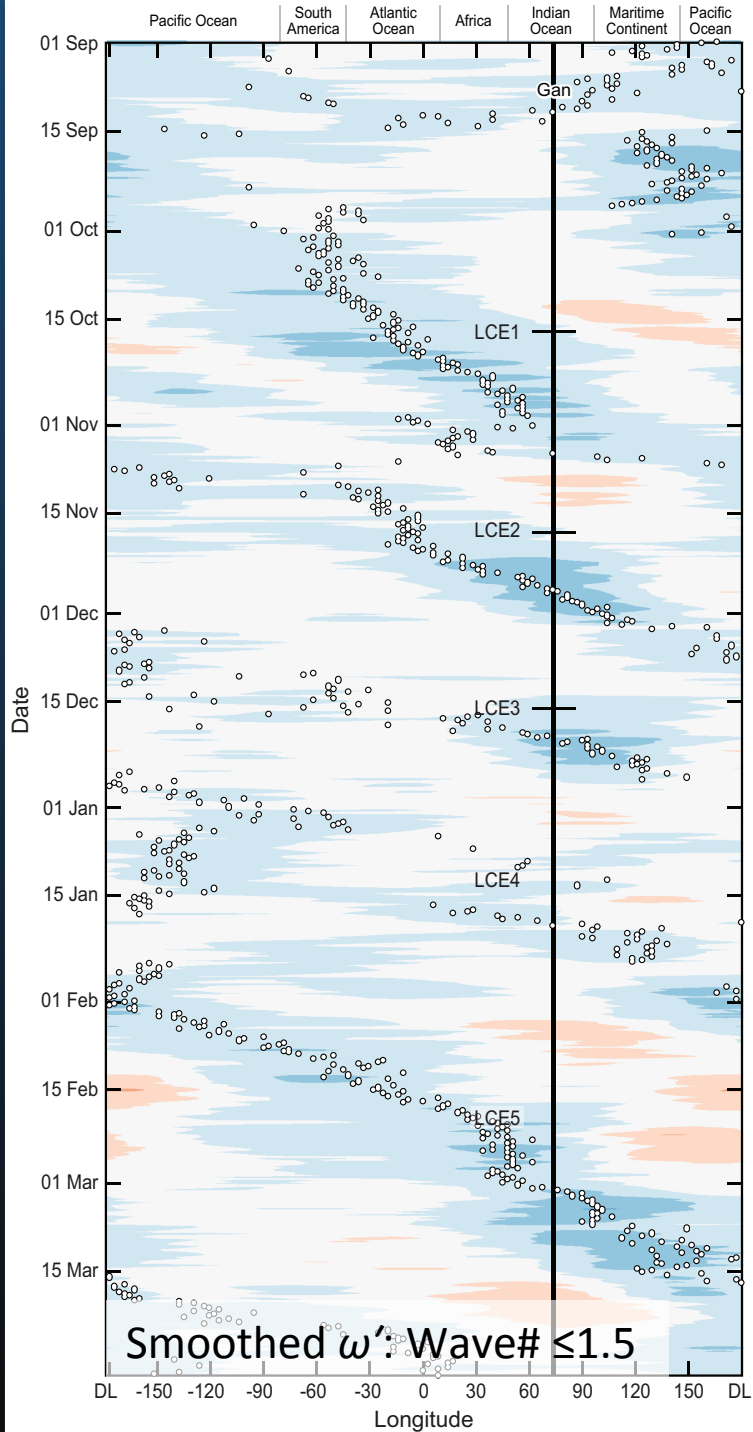


A Potential Mechanism for Driving Congestus Moistening

From ERA-I

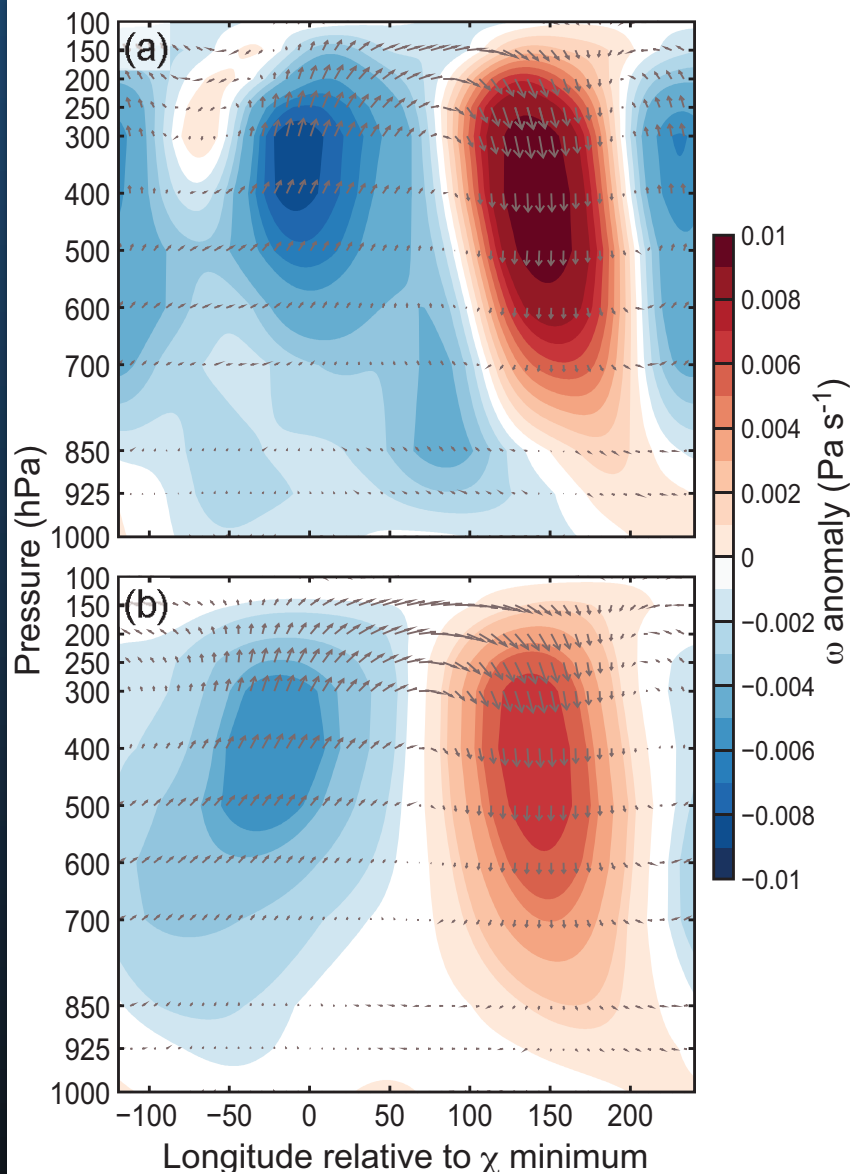




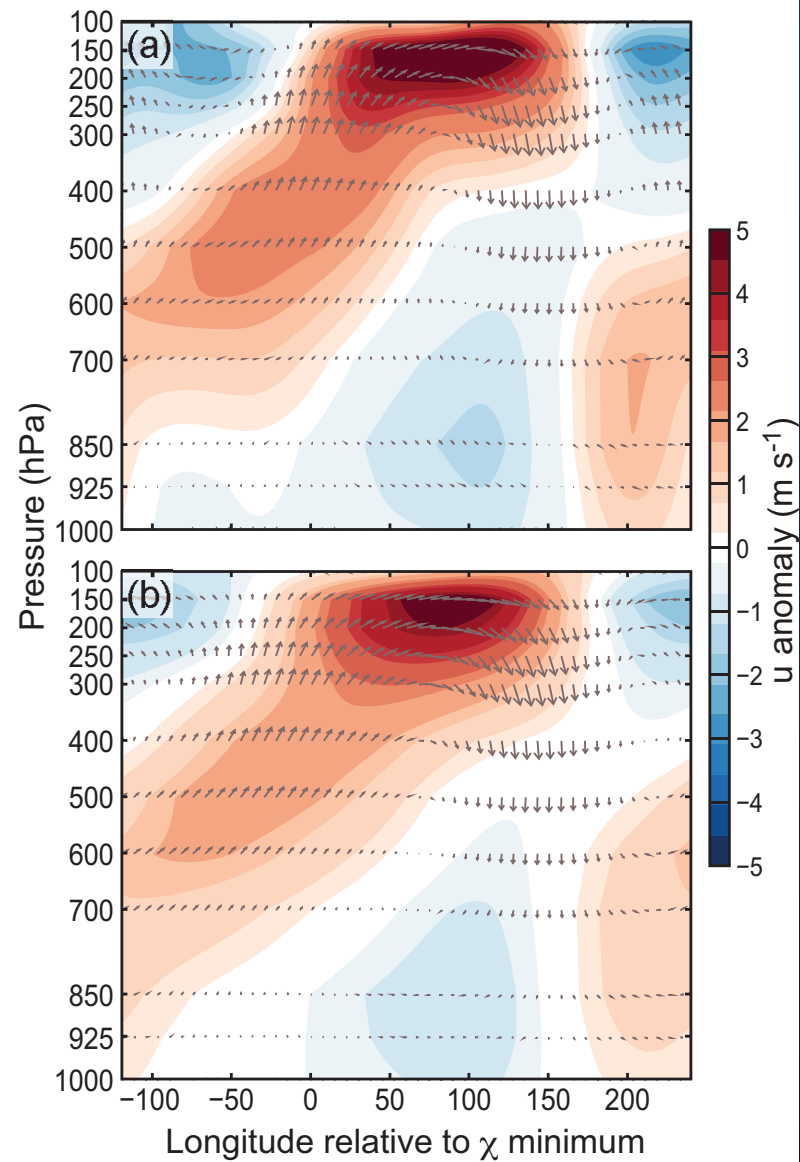


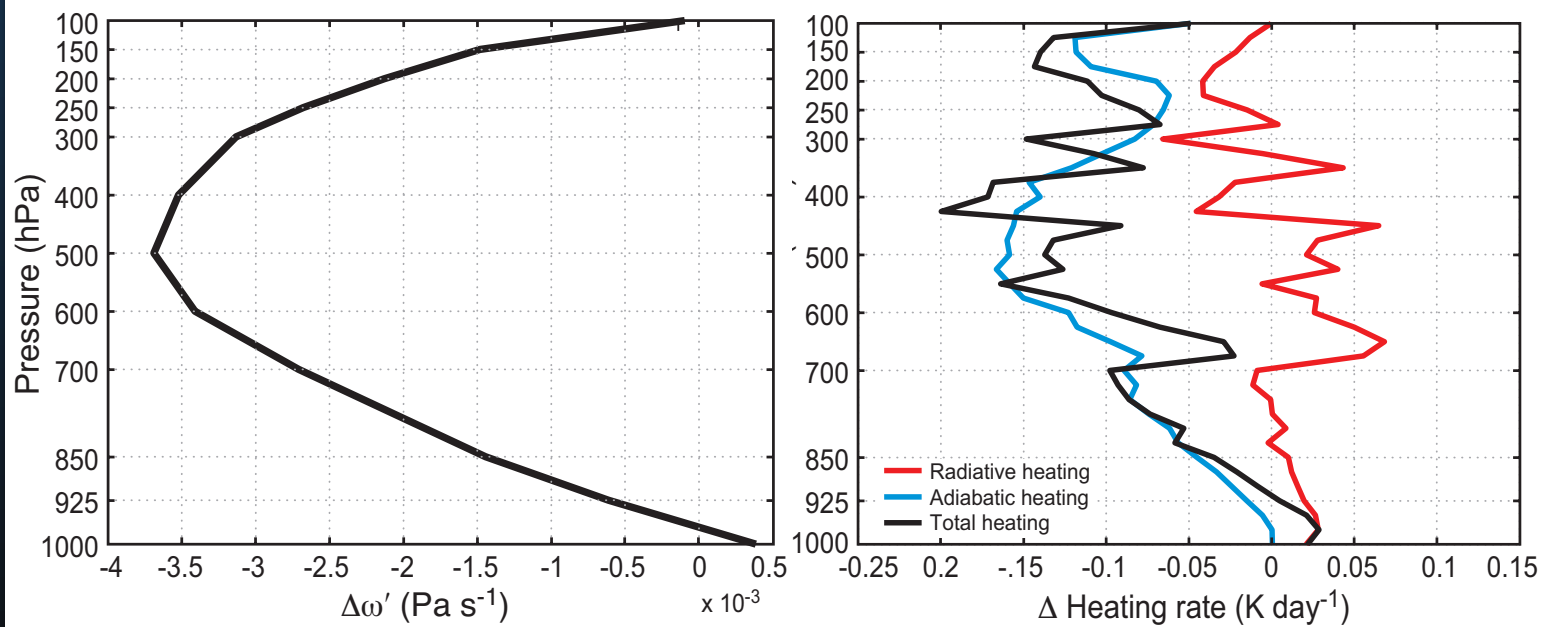
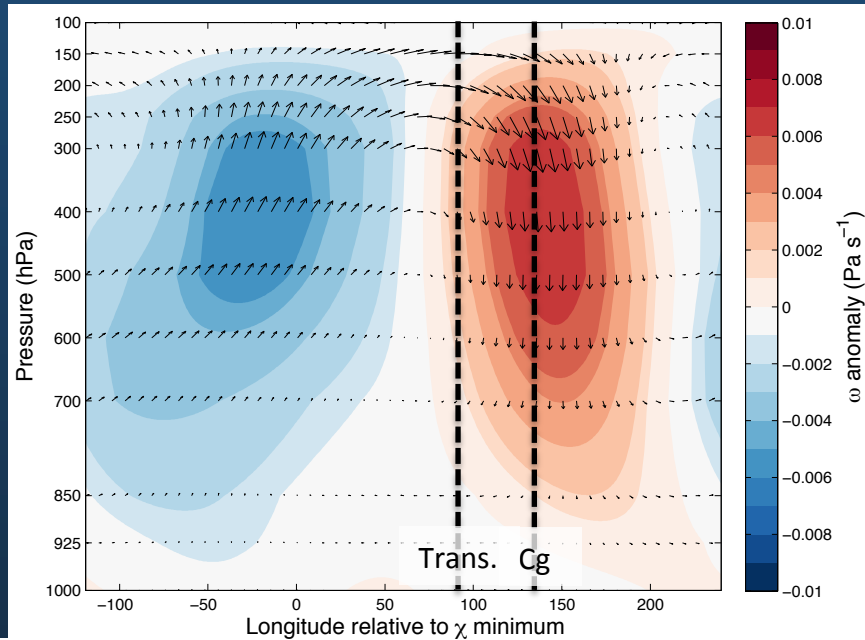
ω' u'

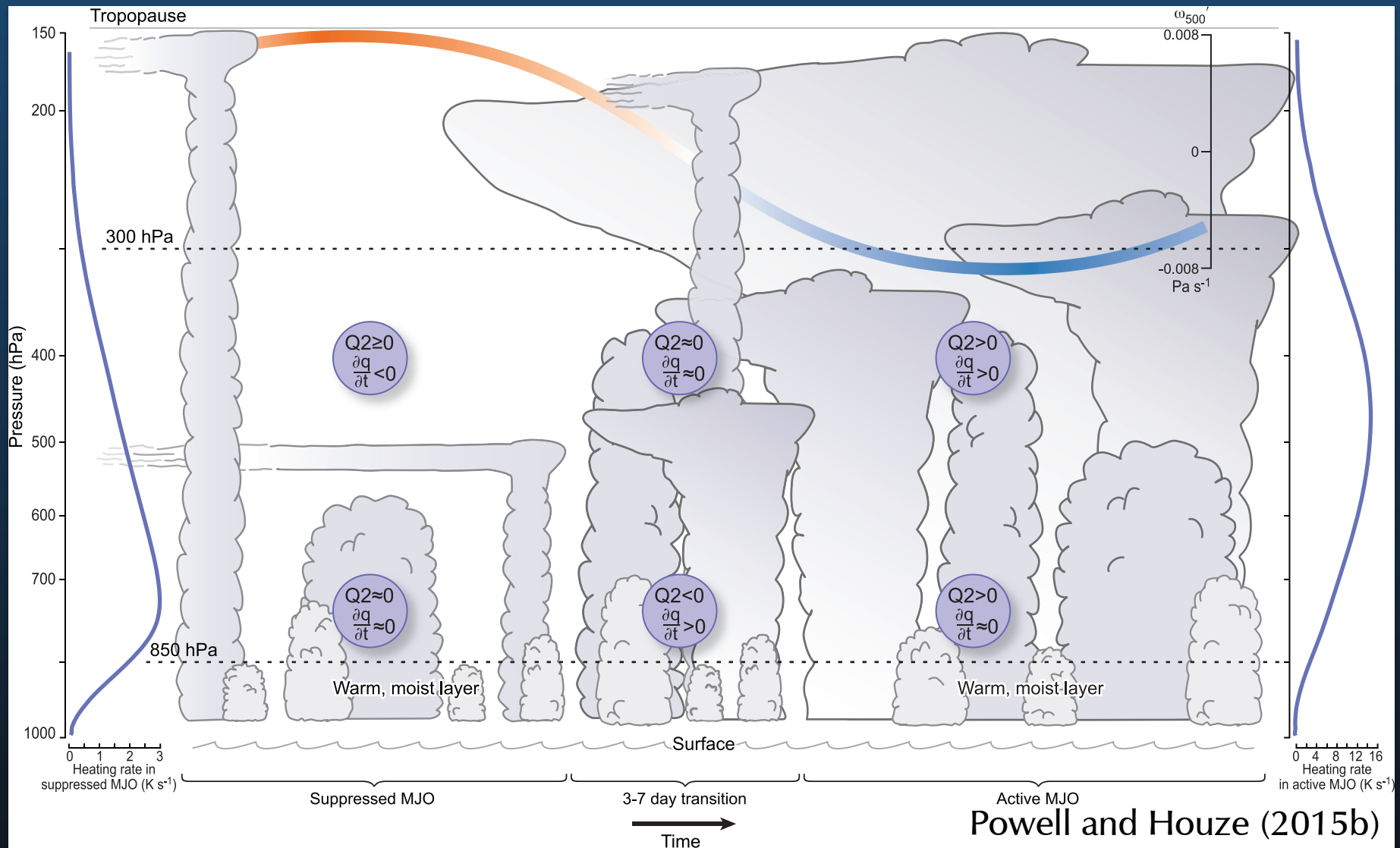
Wave #
 ≤ 3

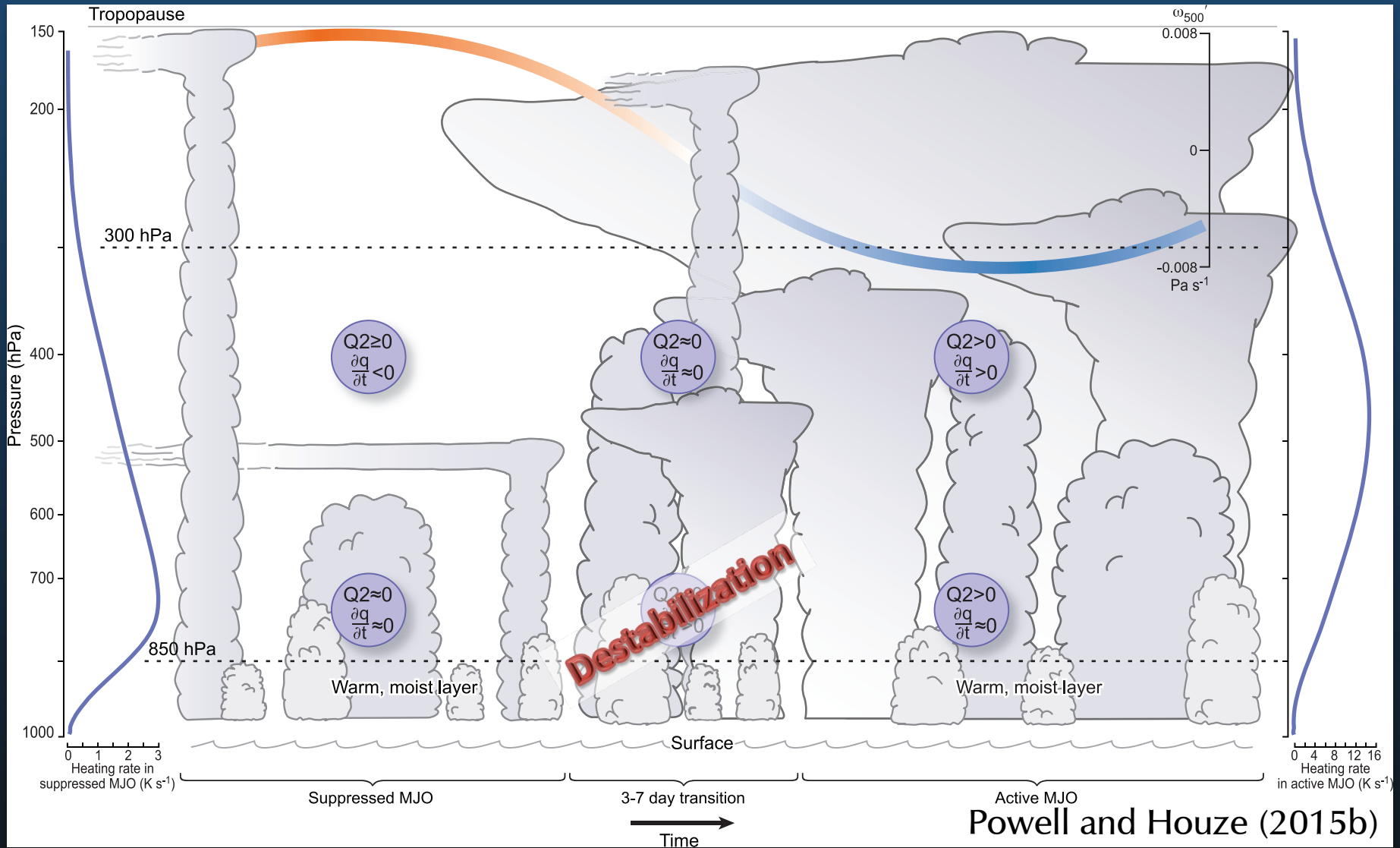


Wave #
 ≤ 1.5

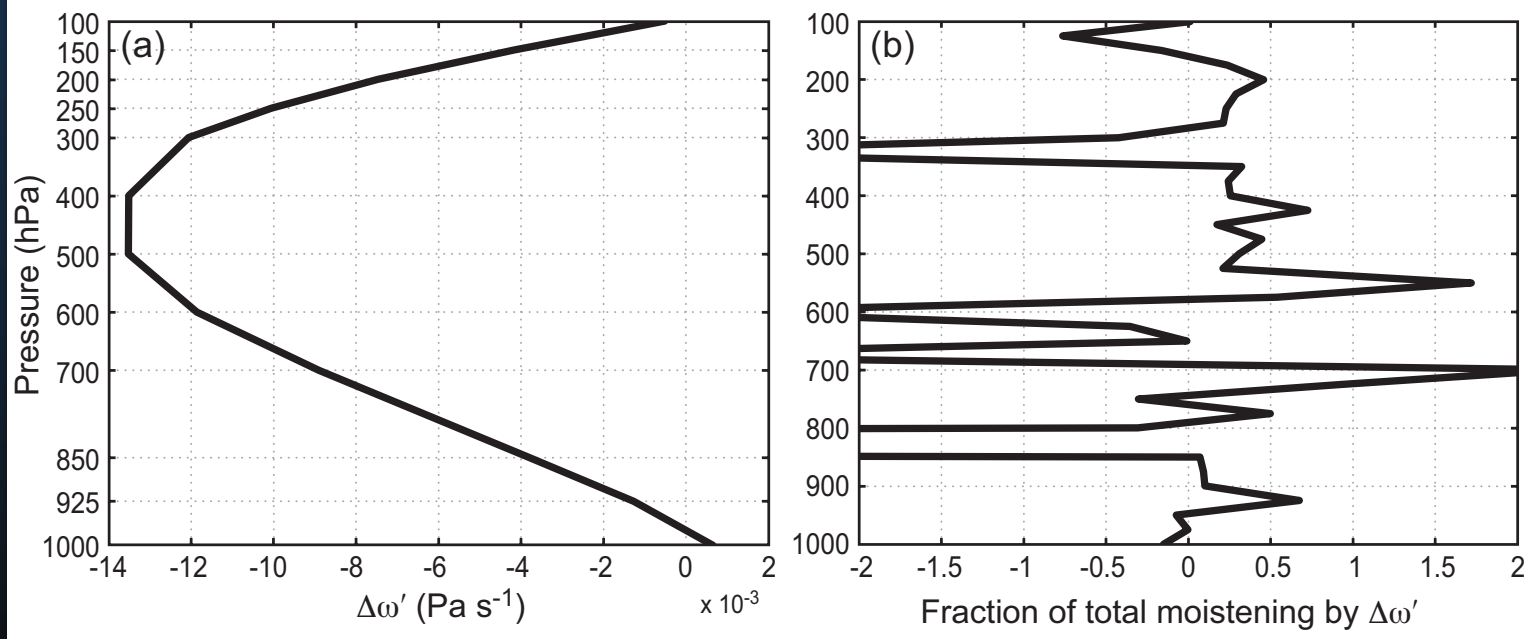
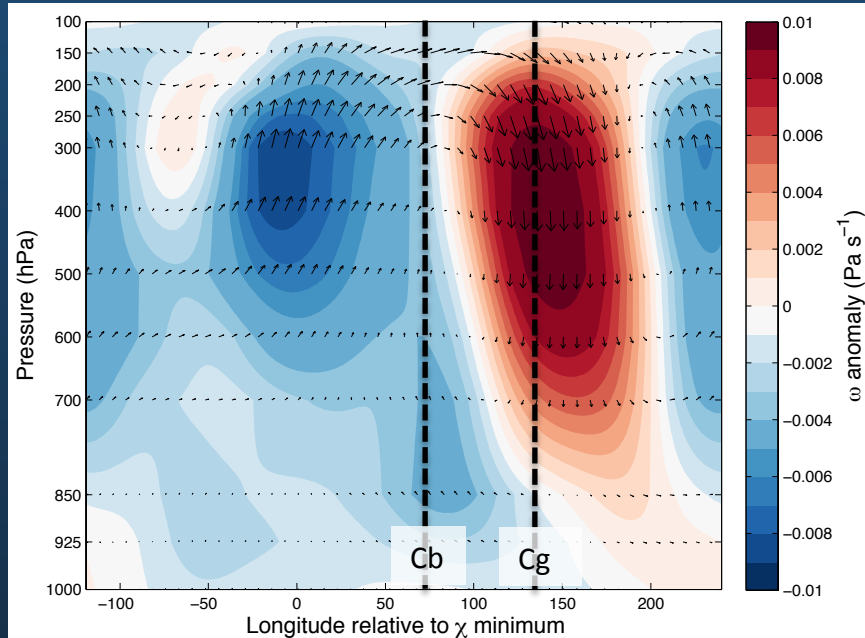


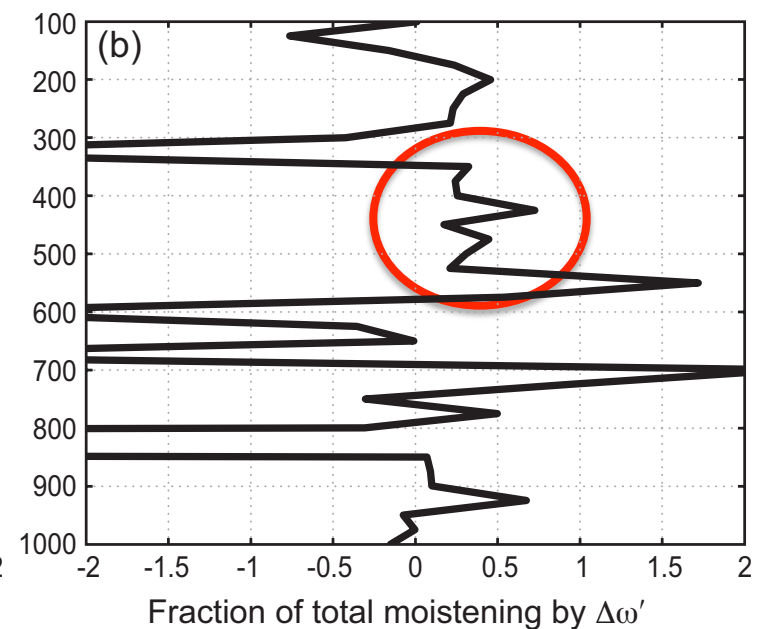
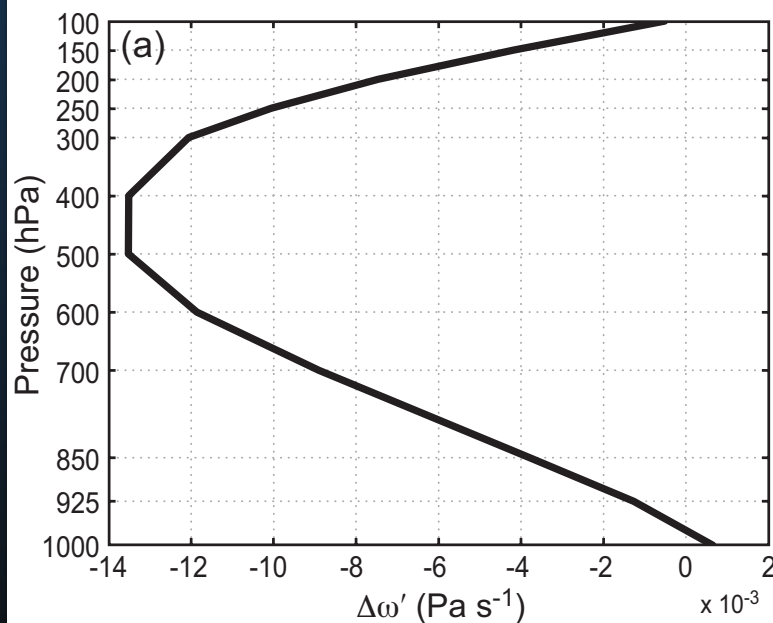
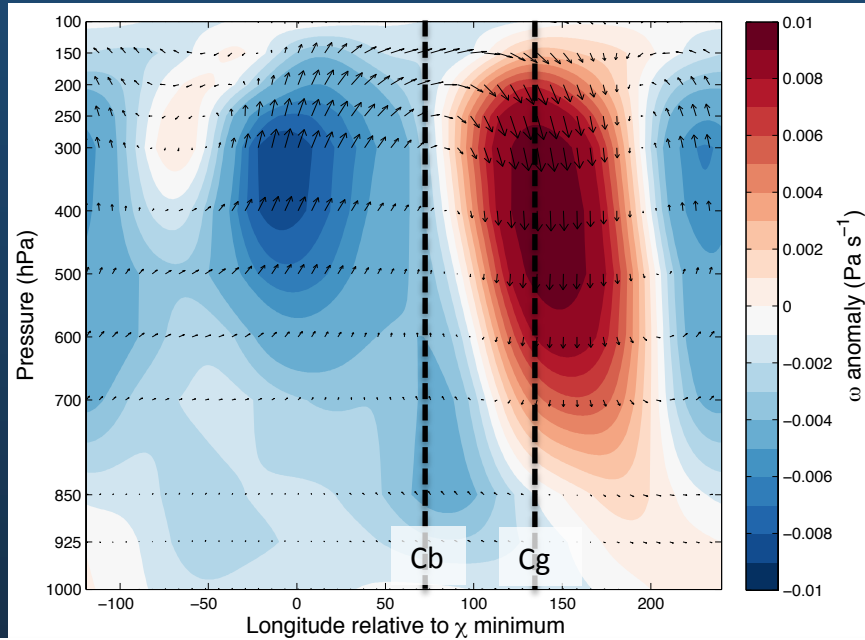


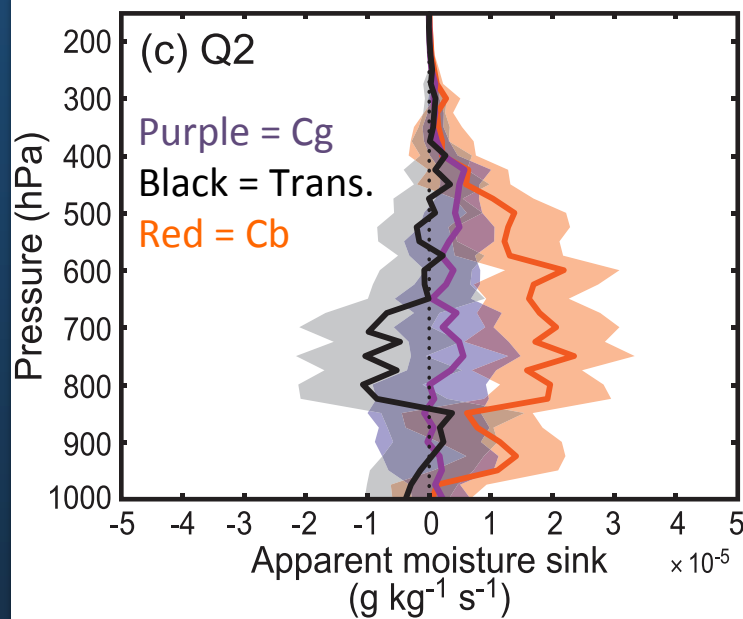




Extras





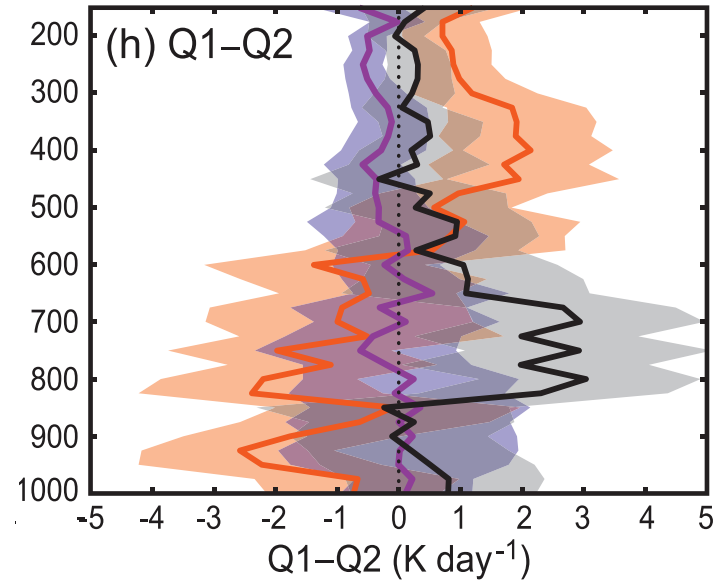
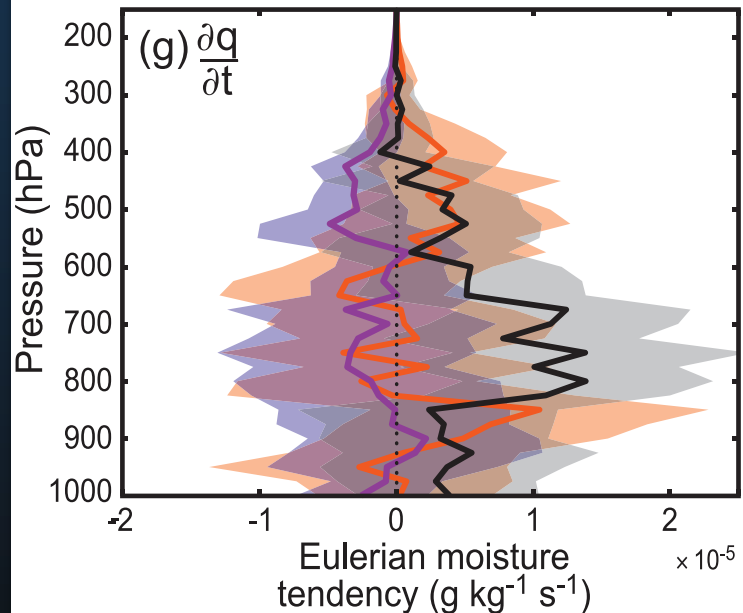


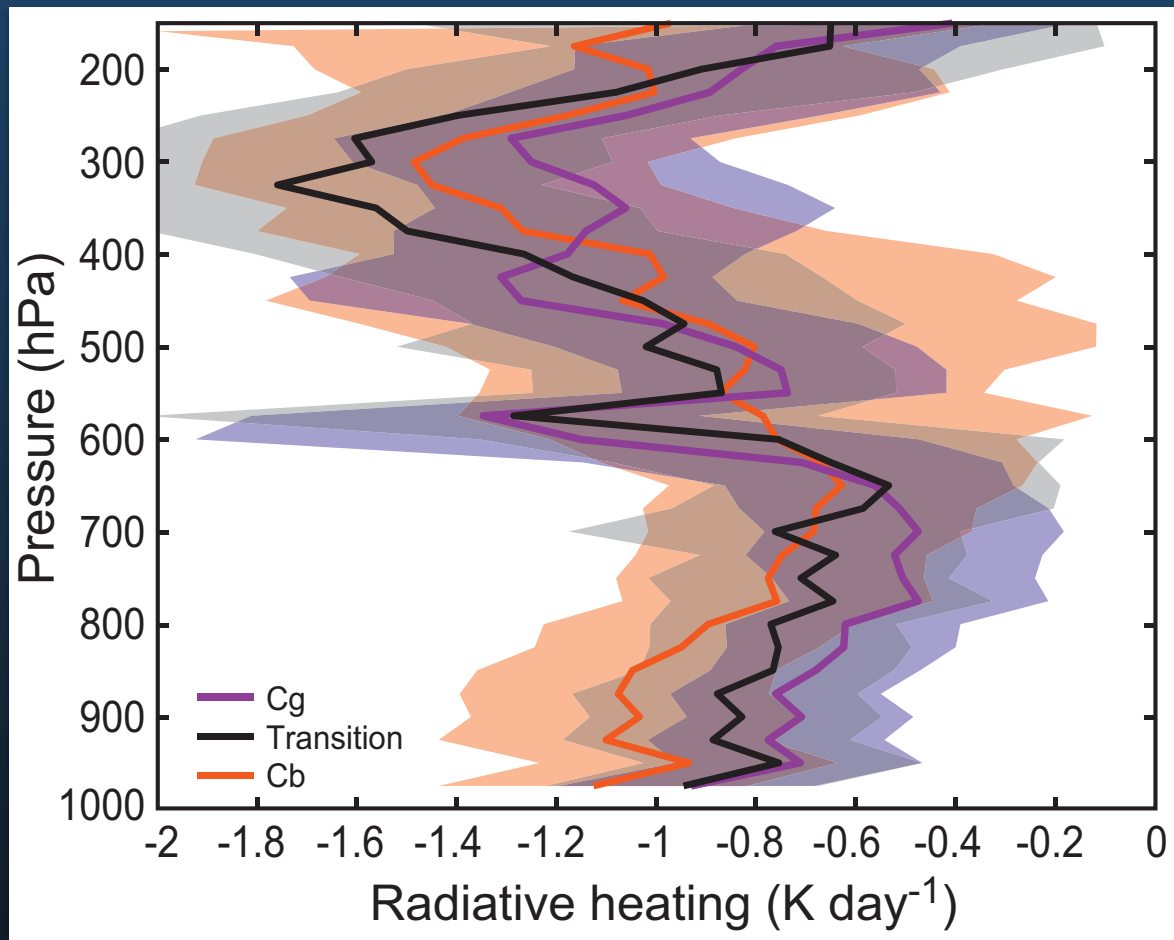
$$Q_2 = (\bar{c} - \bar{e}) + \frac{\partial}{\partial p}(\overline{\omega'q'})$$

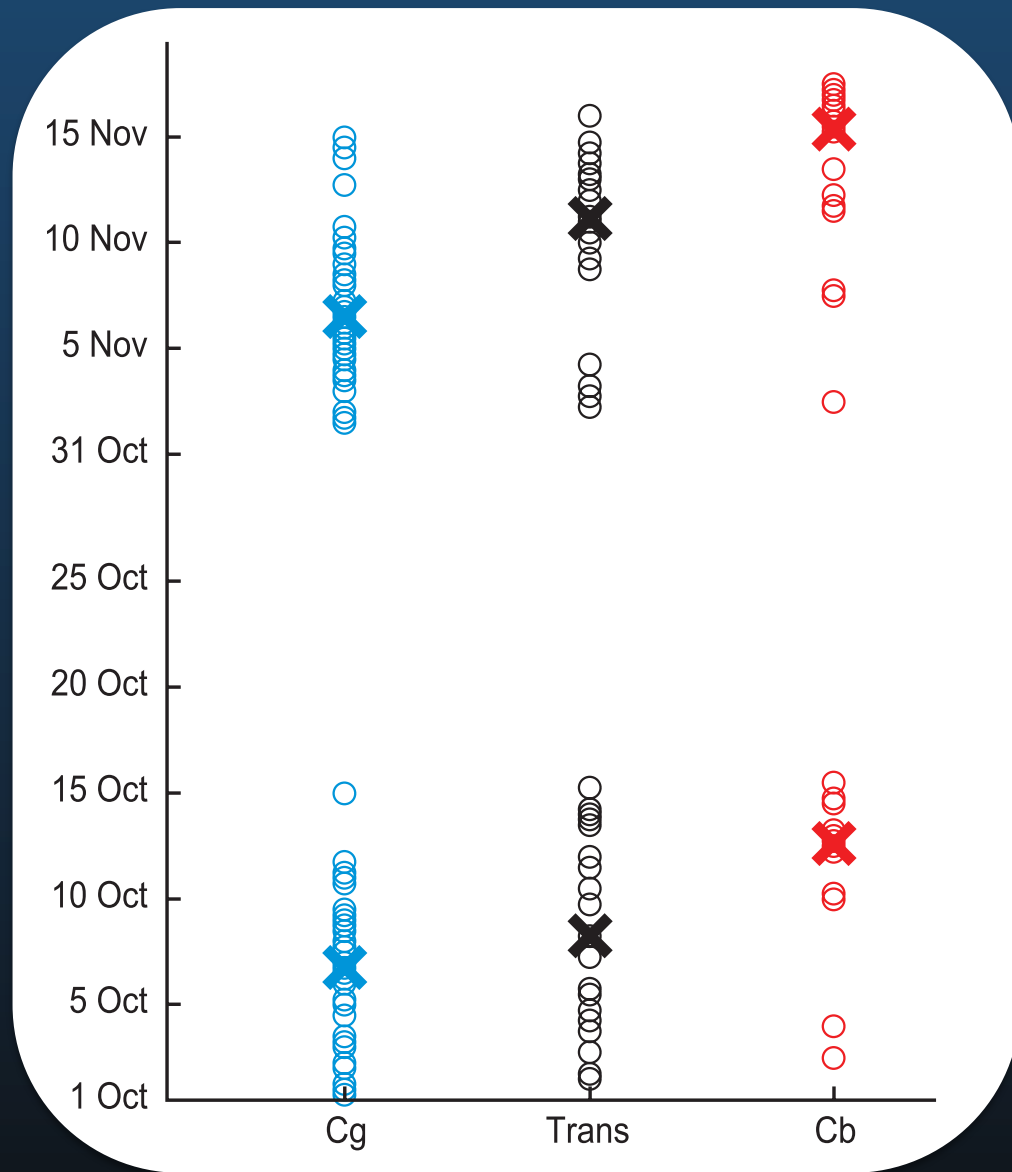
$$\frac{\partial q}{\partial t} = \mathbf{v}_h \cdot \nabla q + \omega \frac{\partial q}{\partial p} + Q_2$$

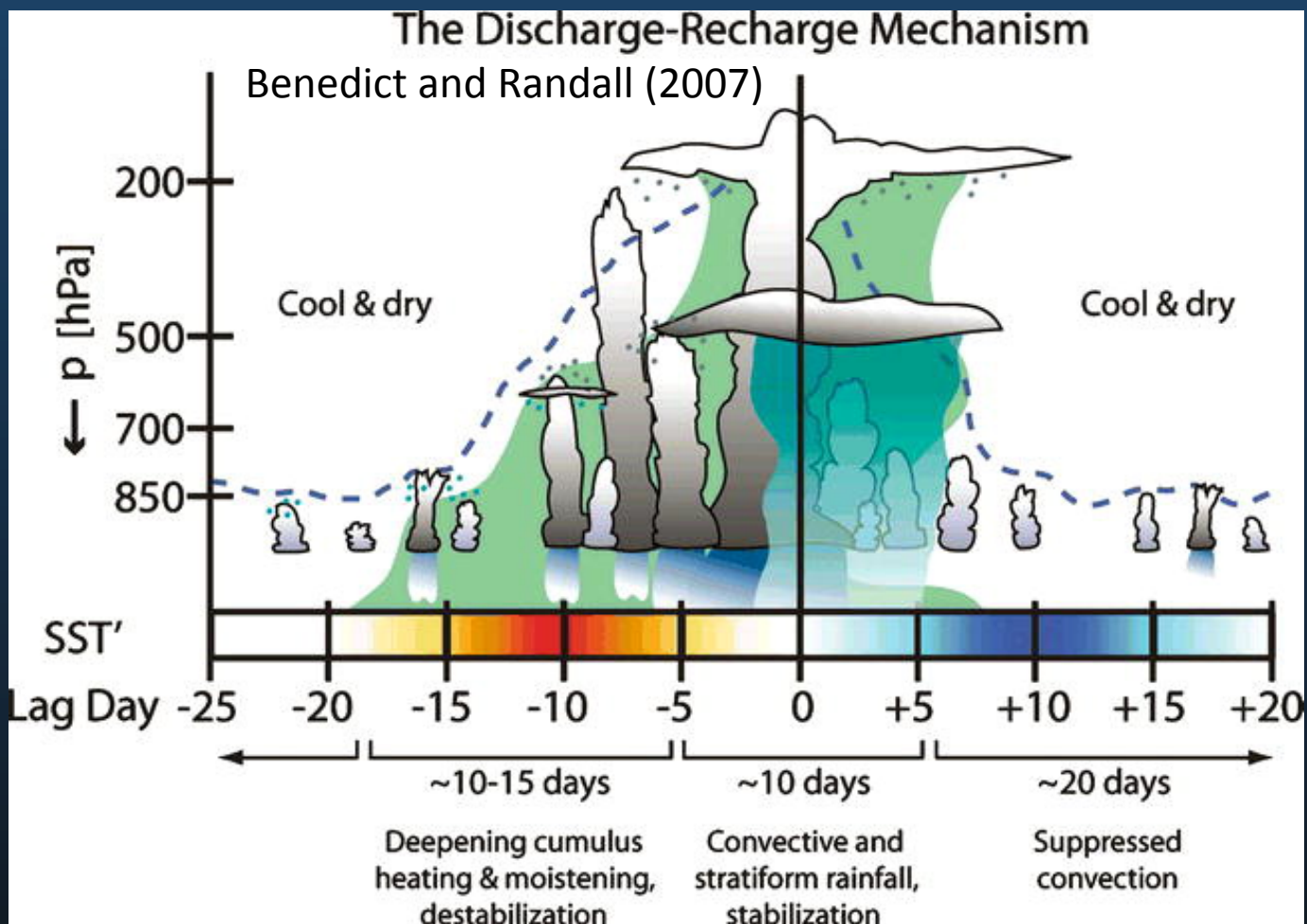
$$Q_1 = Q_R + \frac{1}{c_p} \left[L_v (\bar{c} - \bar{e}) + \frac{\partial}{\partial p}(\overline{\omega's'}) \right]$$

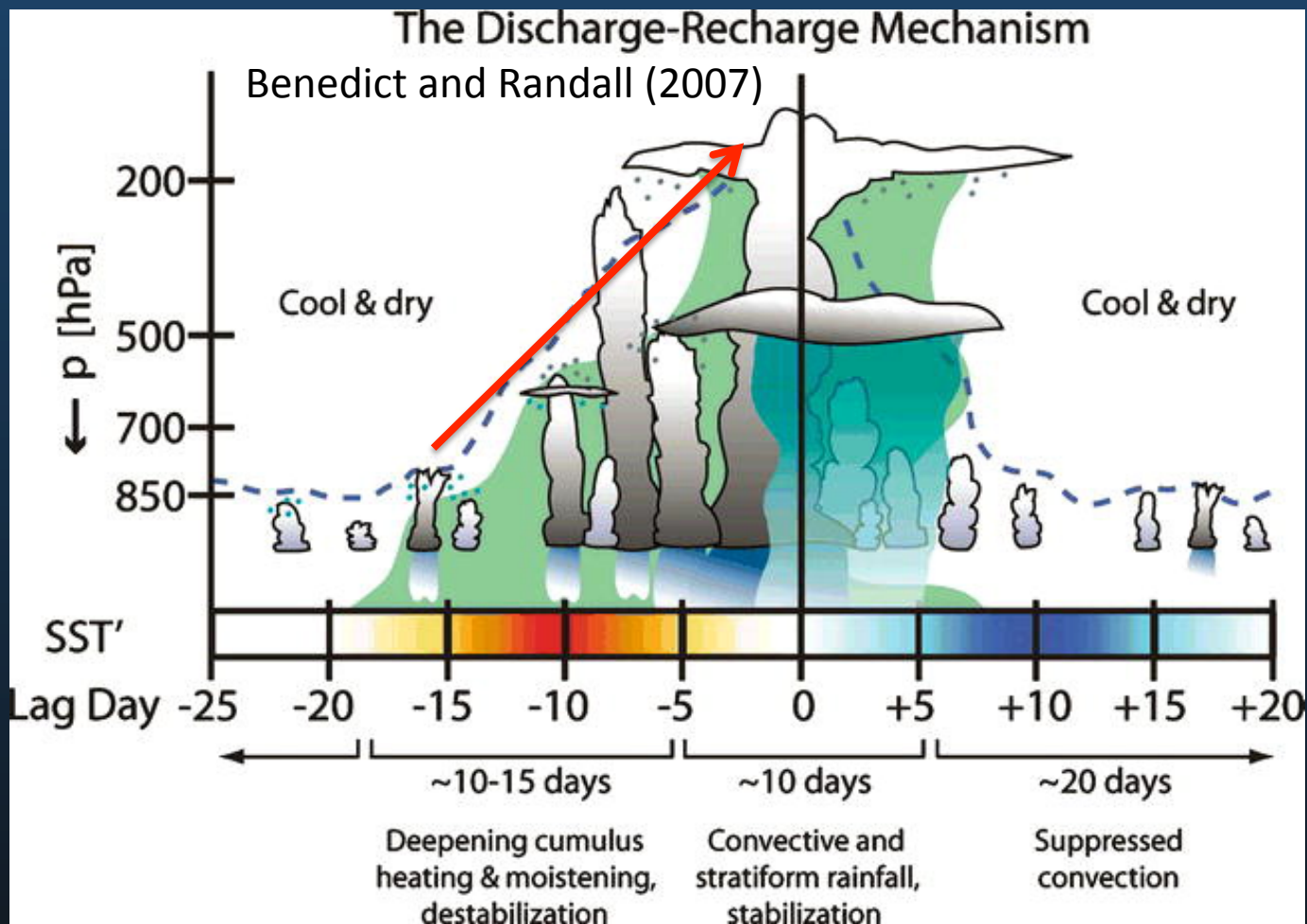
$$Q_1 - \frac{L_v}{c_p} Q_2 = Q_R - \frac{1}{c_p} \frac{\partial}{\partial p}(\overline{\omega'h'})$$

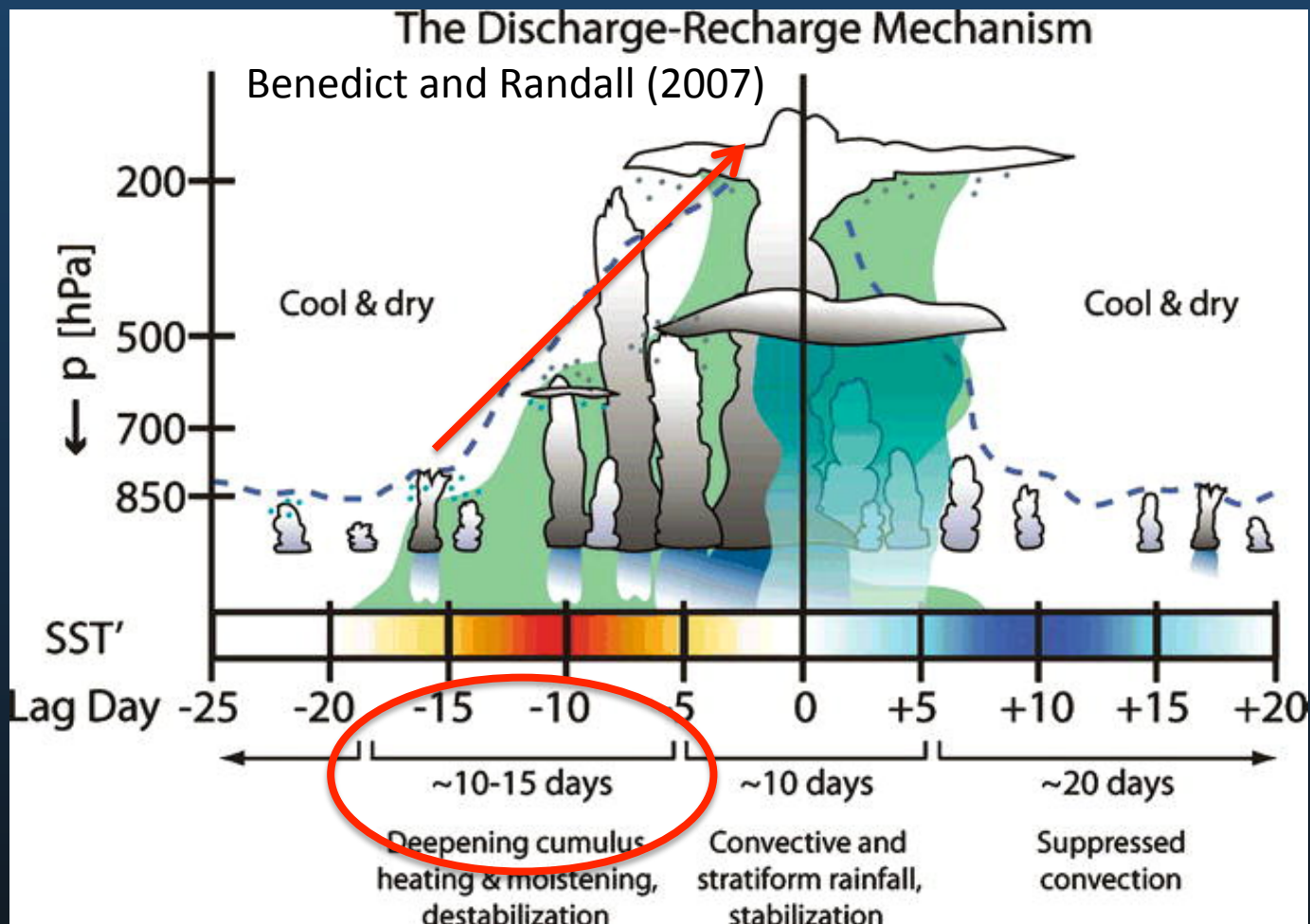




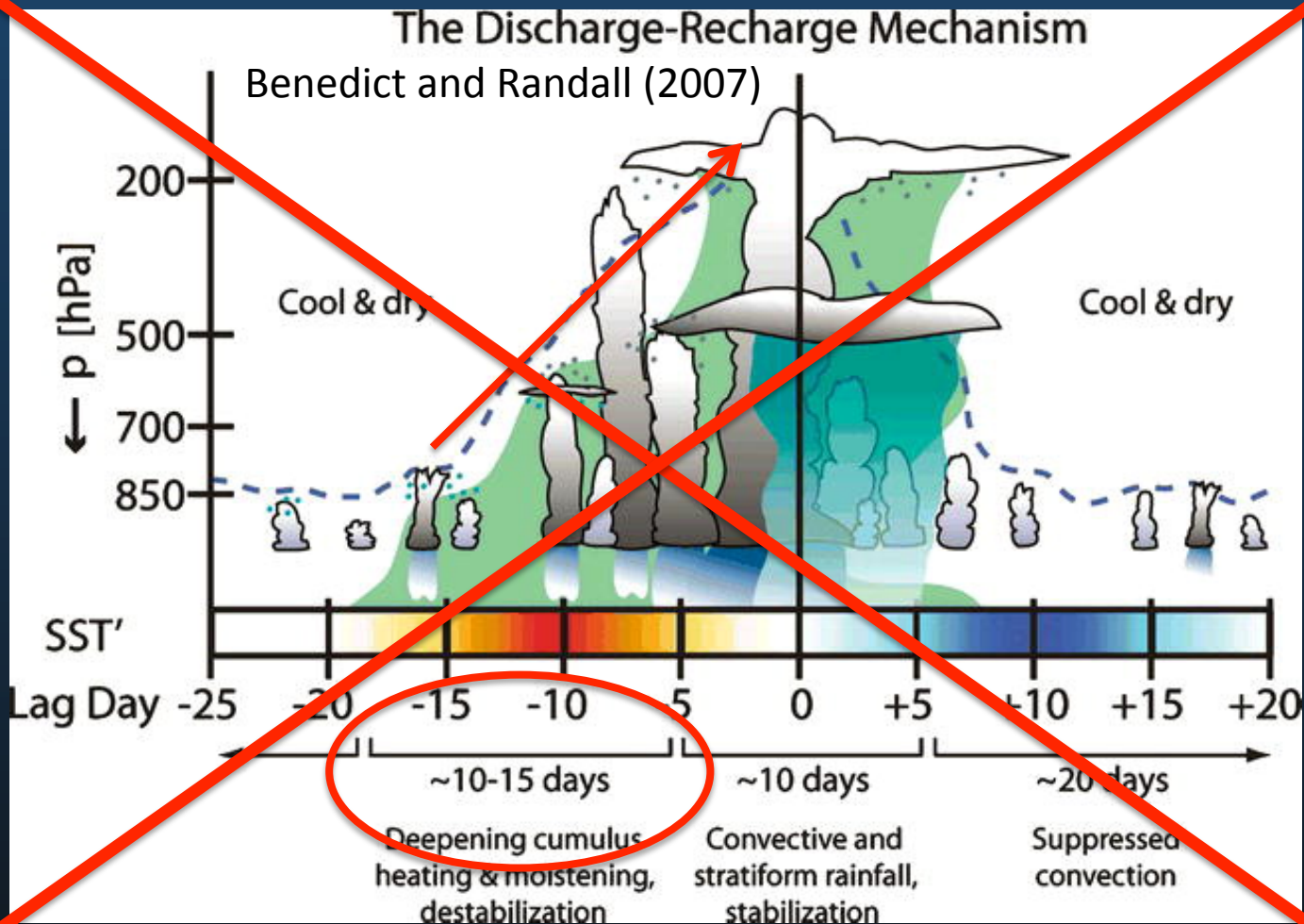


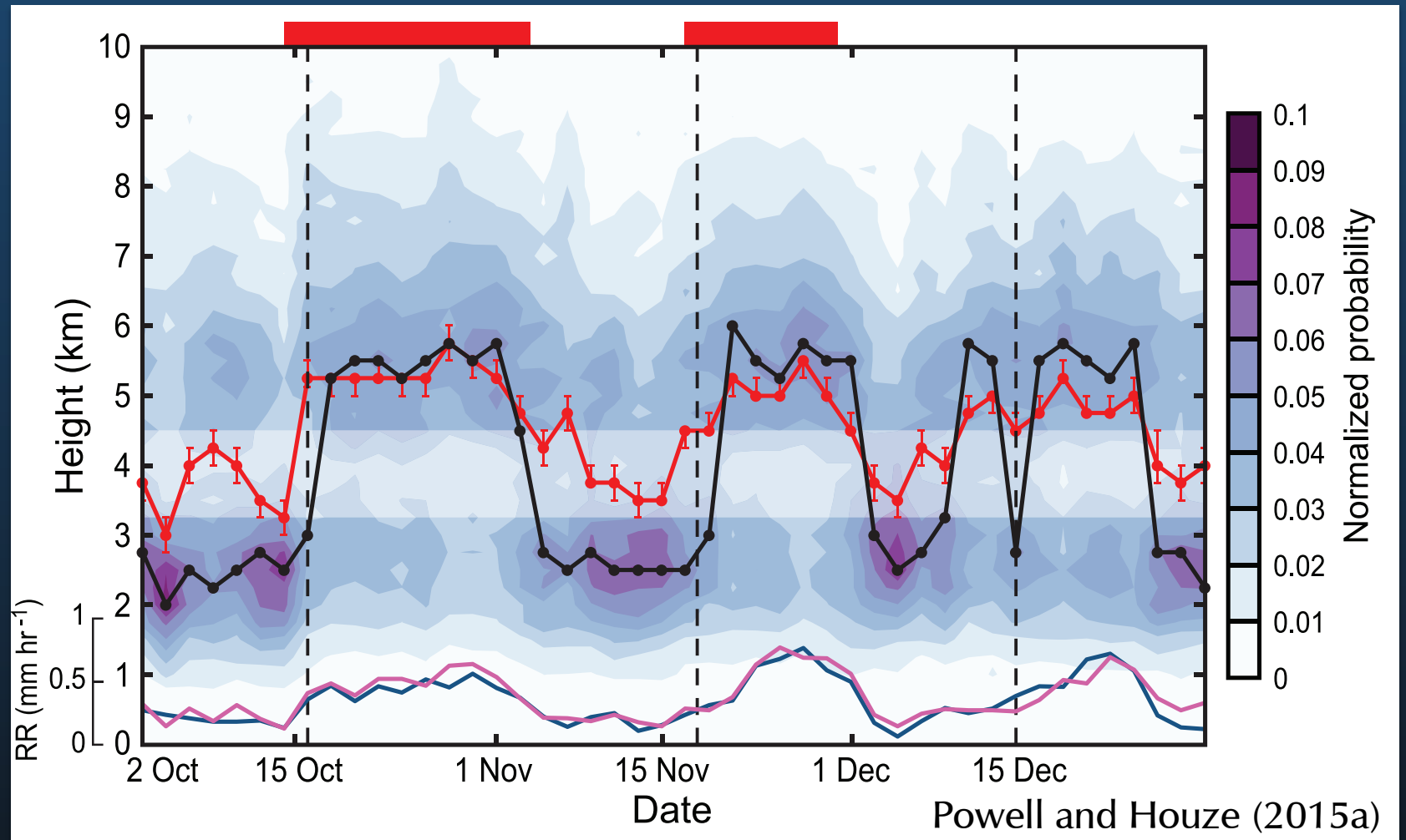


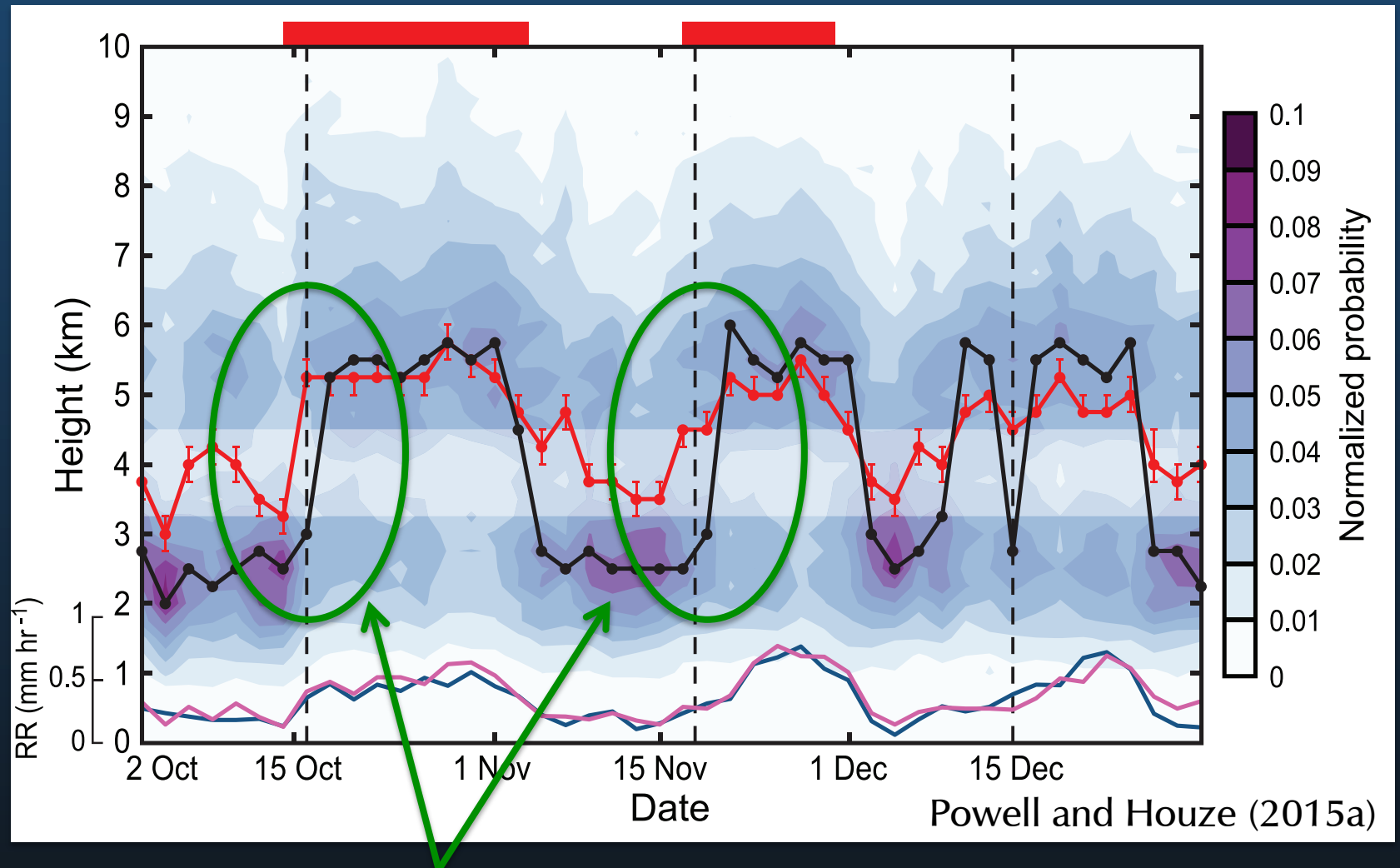




10–15 days or more!







Actually 2–6 days

