# IASI $\delta$D and q during MJO events

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# Introduction - Goals

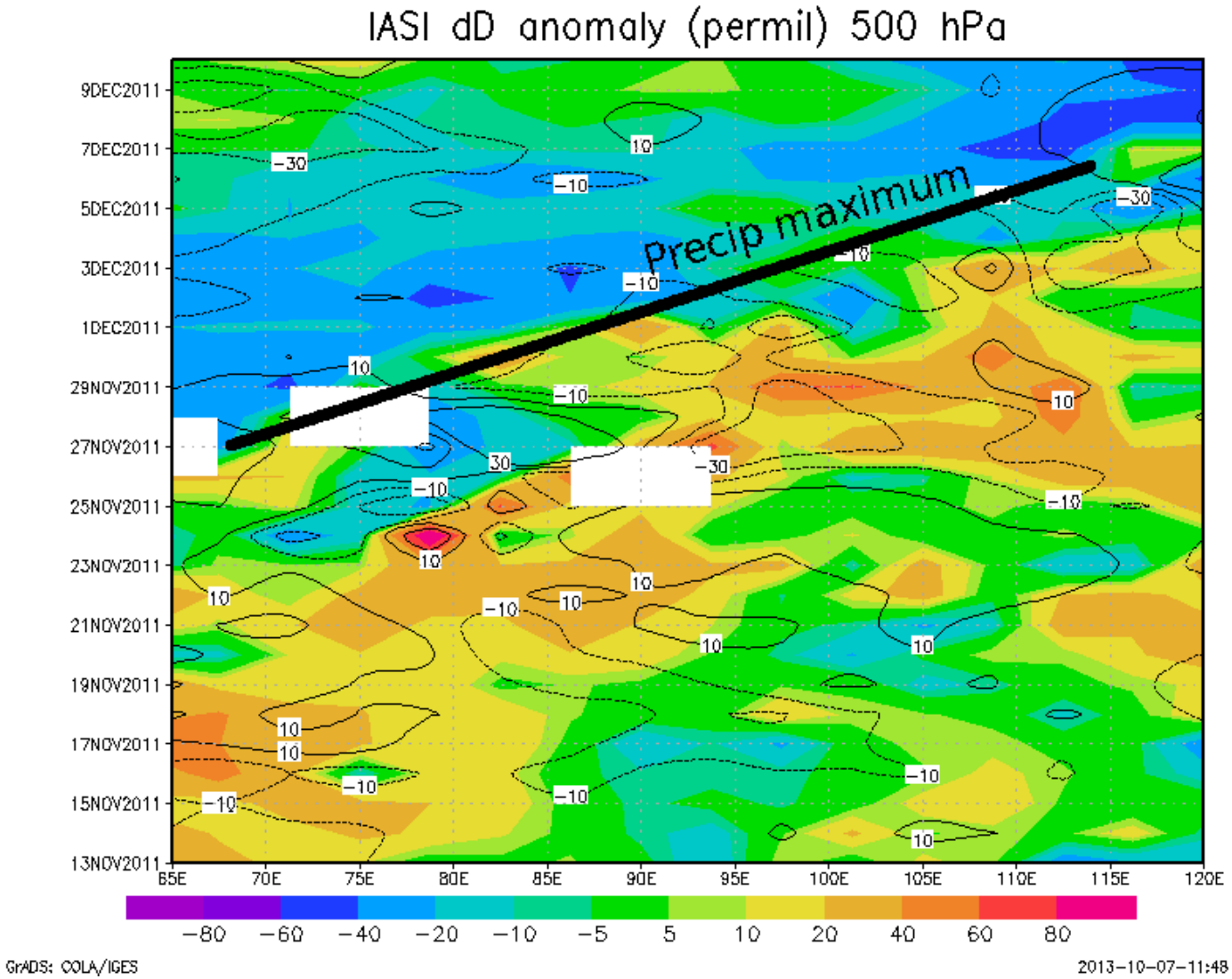
Goals:

- Study q-$\delta$D dynamics of MJO events and other variability
- Understand which processes are important for MJO simulation
- Understand how MJO dynamics potentially differ from other factors:
  - Degree of organization of convection
  - Distance to convection
  - Precipitation intensity
- Use q-$\delta$D dynamics to analyse/improve model physics

Analyse the q-$\delta$D structure in the Indian ocean (20S-20N,60E-140E):

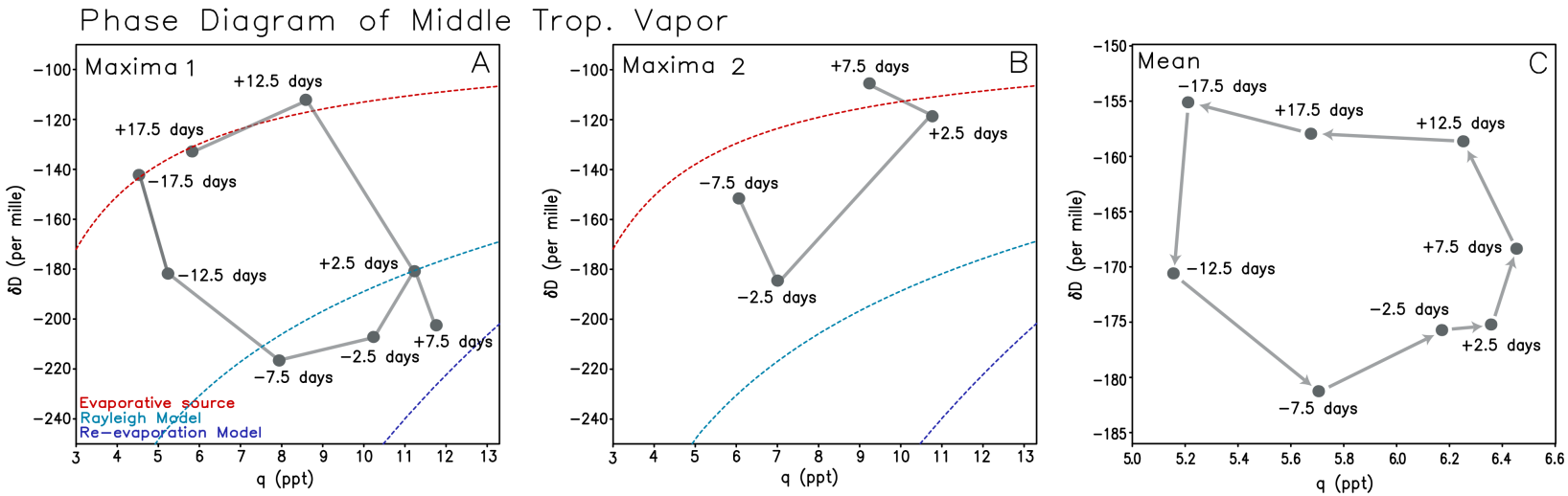
- Use IASI q and $\delta$D, compared with strongly guided LMDZ simulations
- Study of Cindy/Dynamo MJO case, nov-dec 2011

# MJO event - November 2011 (mean for 10S-10N)

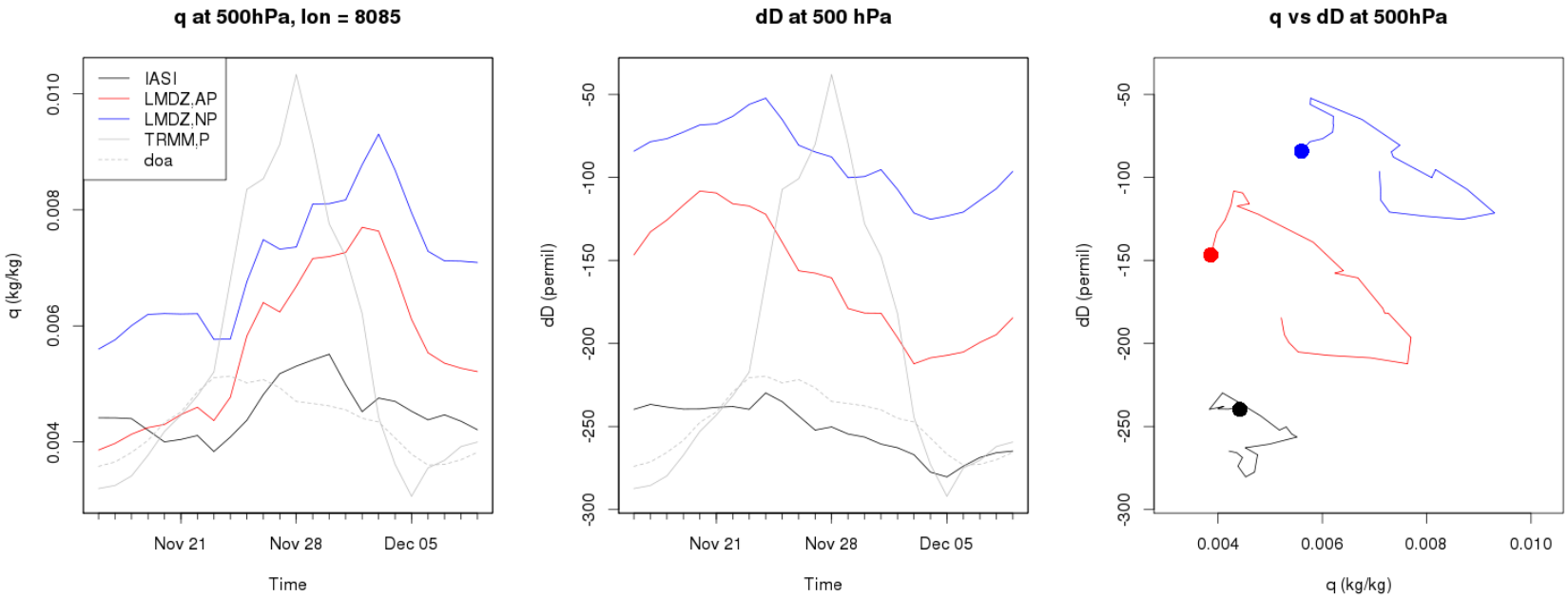


# Composite of MJO events

Based on TES-data, for 12S-12N,90-120E (Berkelhammer,2012):

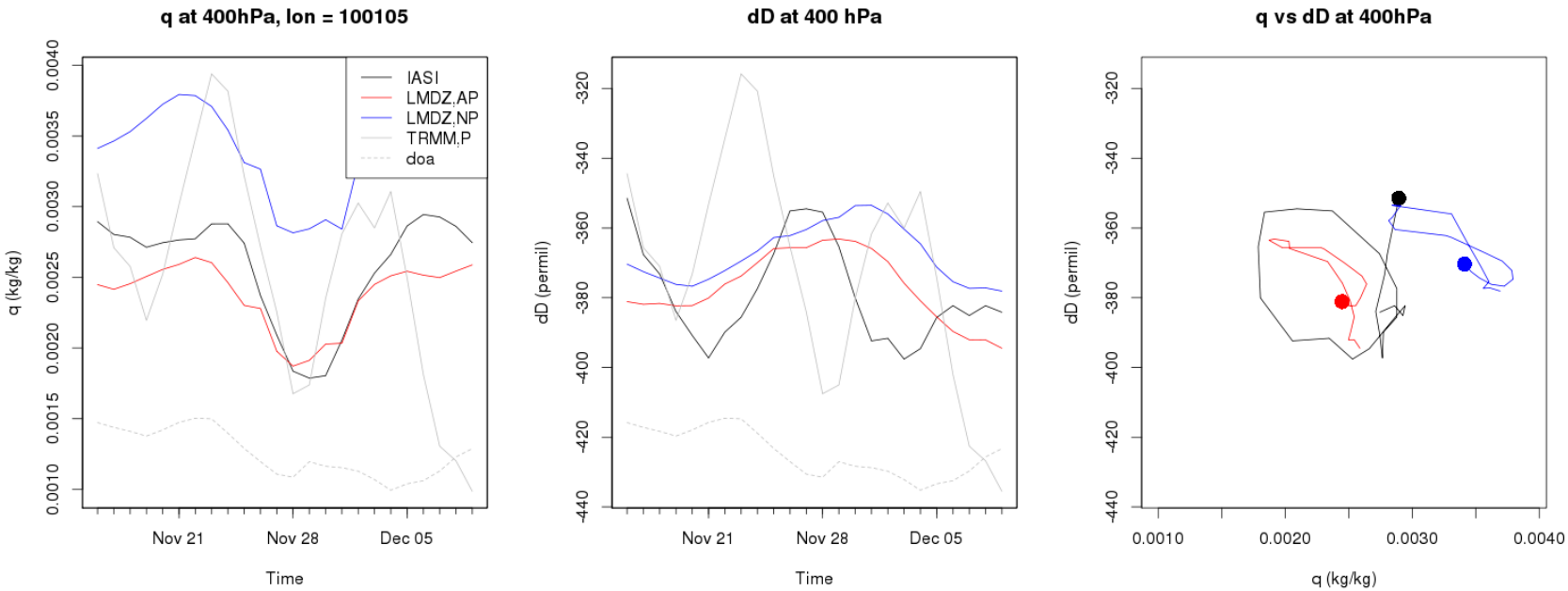


# Temporal dynamics at 500 hPa (80-85E)



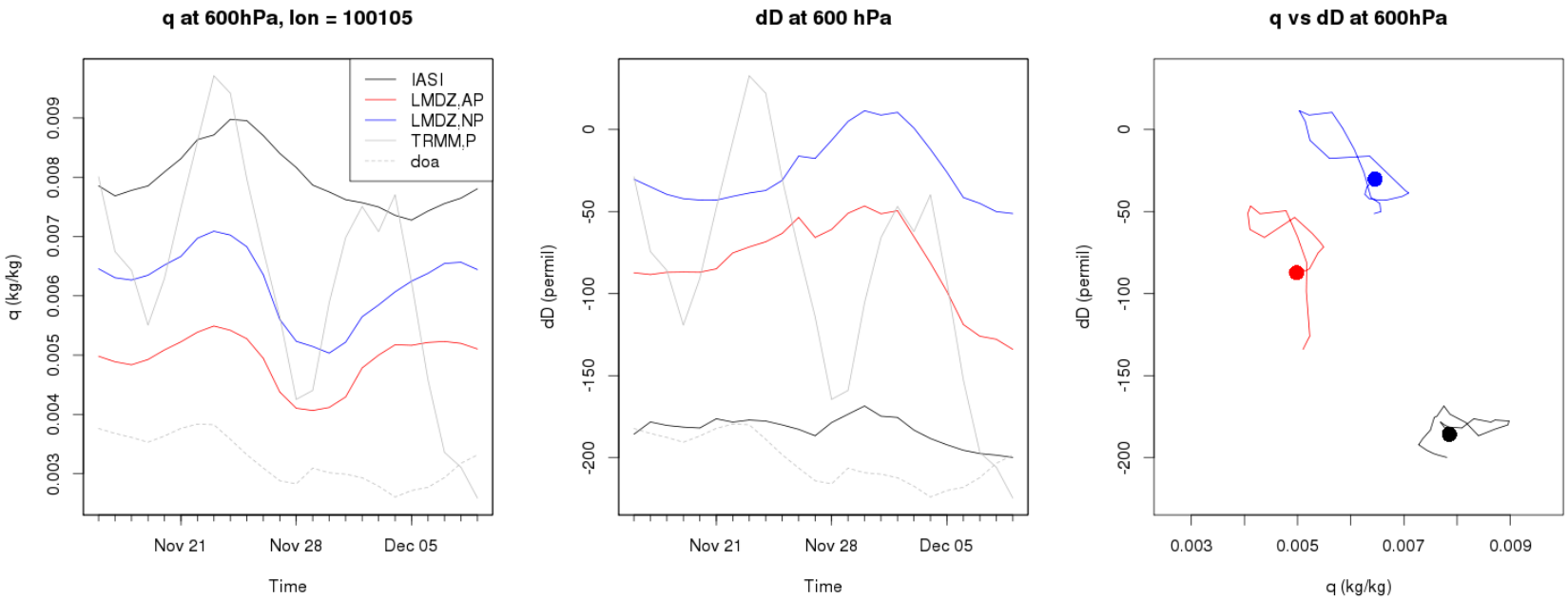

q vs $\delta$D MJO cycle opposed to Berkelhammer (2012)

# Temporal dynamics at 400 hPa, 100-105E




Phase shift compared to IASI $\delta$D, MJO cycle similar to Berkelhammer (2012).

# Temporal dynamics at 600 hPa, 100-105E

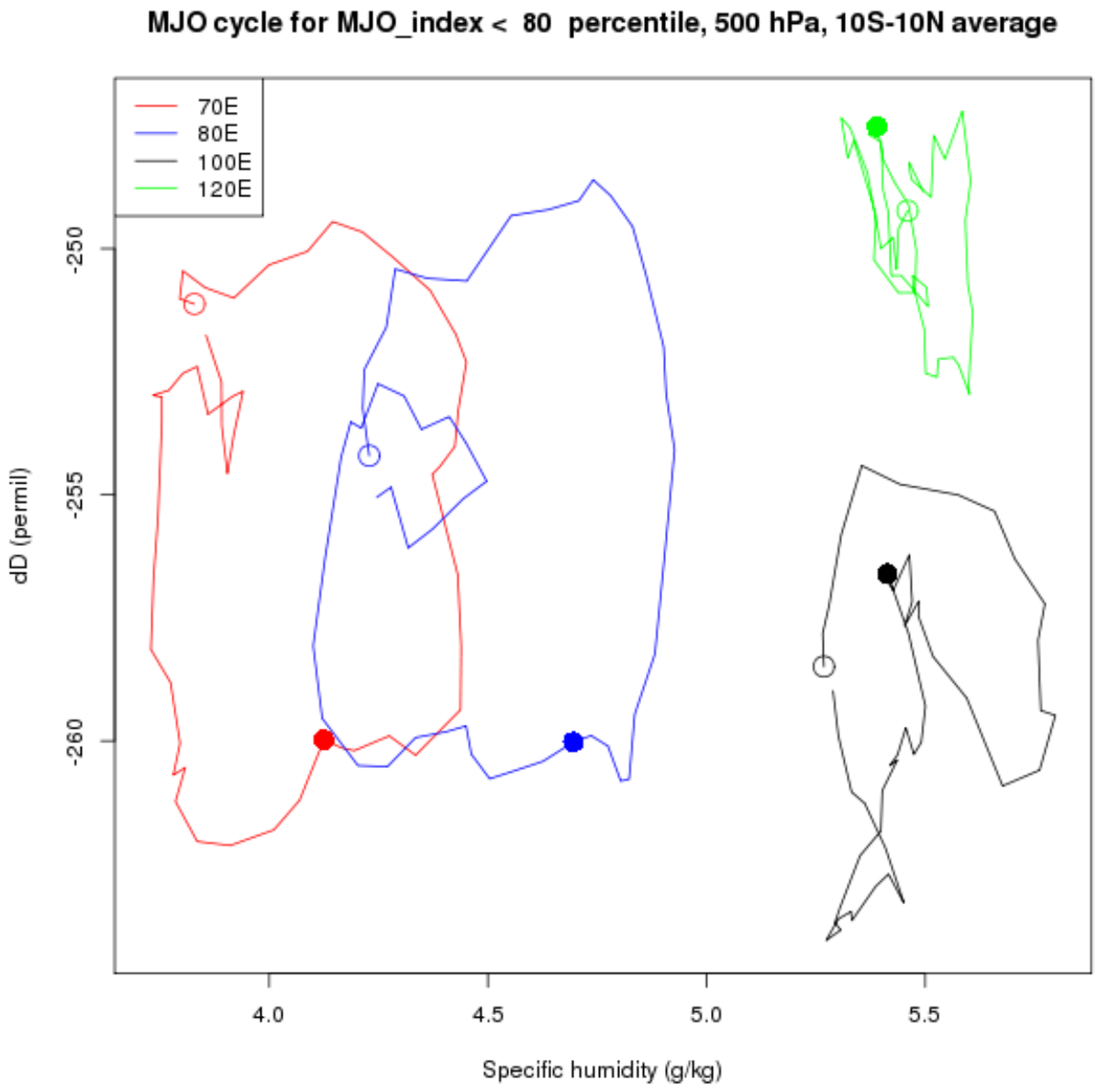



Less $\delta$D variability in IASI than in LMDZ.

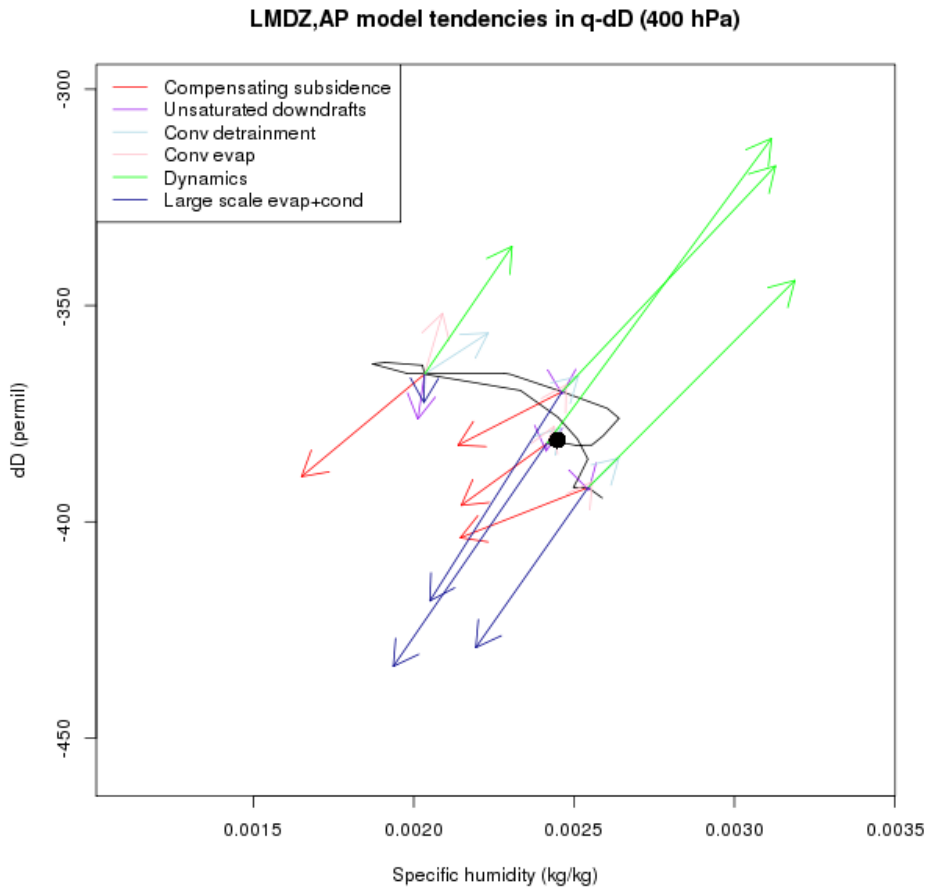
# Conclusions

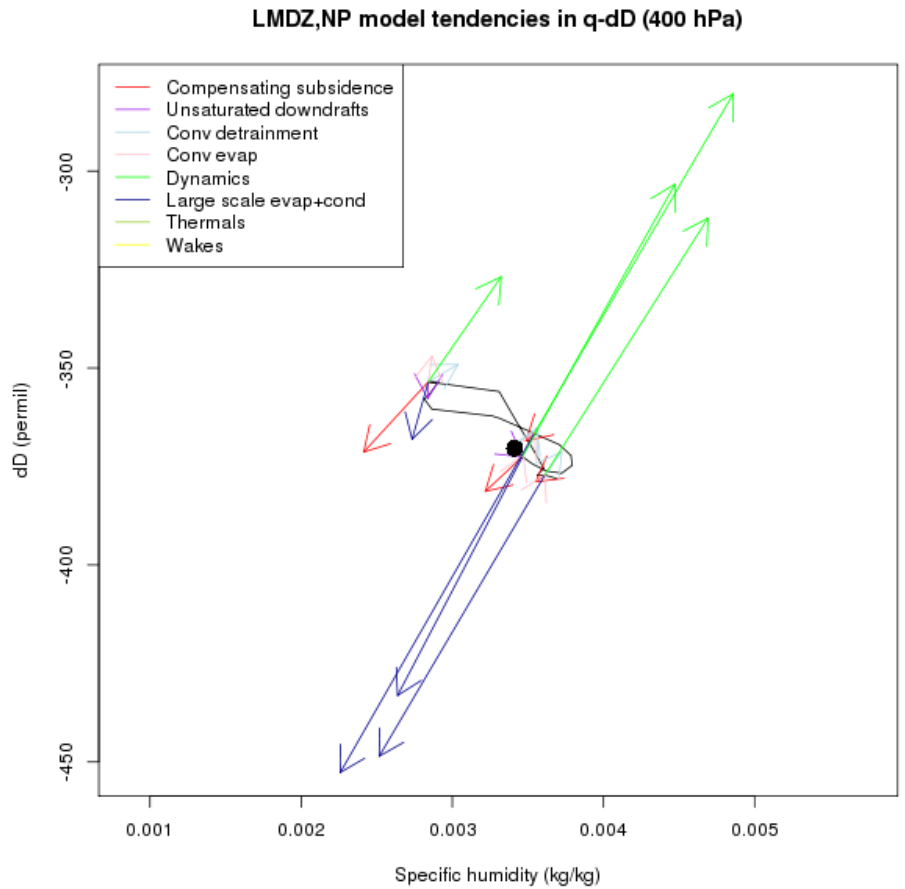
- MJO q vs $\delta$D cycles are not always like Berkelhammer, 2012
- LMDZ bias in q, $\delta$D, but dynamics are reasonable (sometimes with phase-shift)
- LMDZ $\delta$D dynamics are at lower levels than for IASI (100E)
- These differences could lead to sensitivity tests in LMDZ physics, such as:
  - precipitation efficiency
  - entrainment speed
  - precipitation droplet fall speed
  - fraction of droplets inside/outside the cloud
  - etc.

# Mean MJO dynamics at 500 hPa



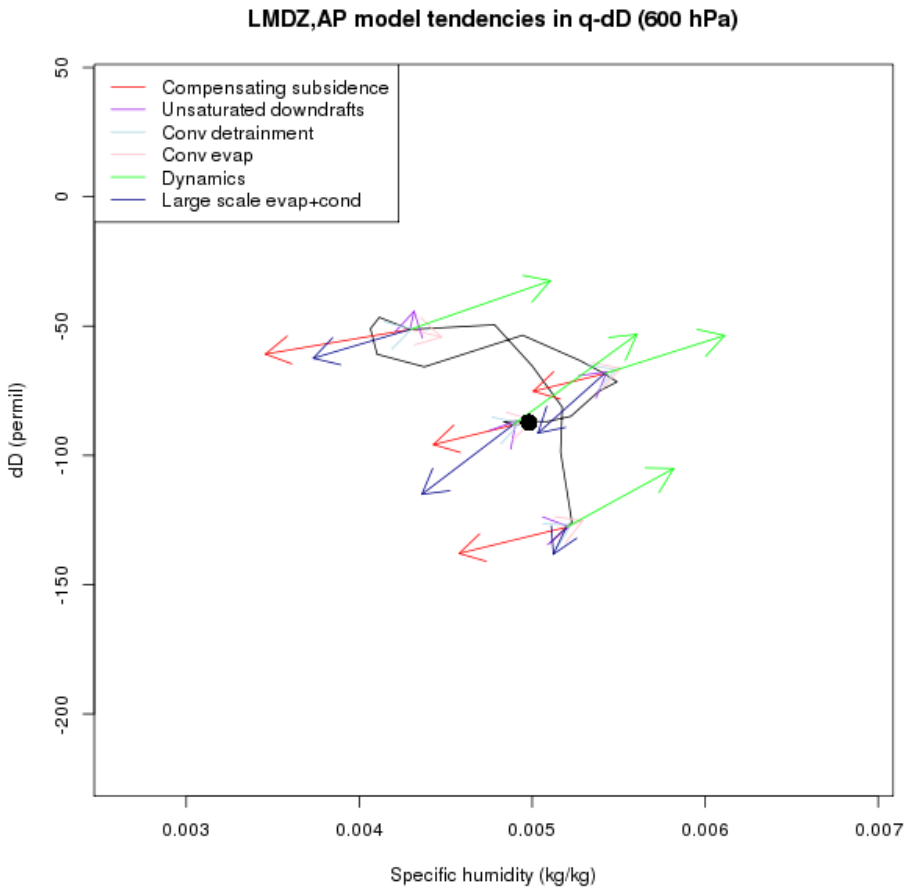
# LMDZ tendencies at 400 hPa, 100-105E

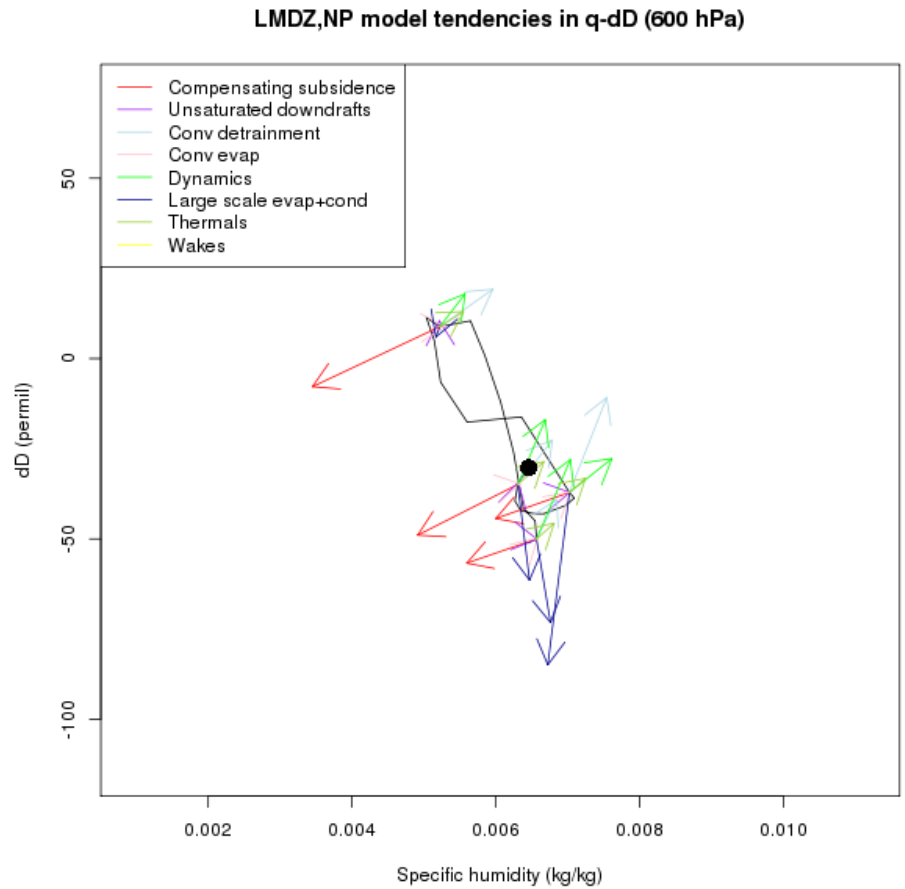



Larger convective tendencies in LMDZ,AP.

# LMDZ tendencies at 600 hPa, 100-105E




Larger convective tendencies in LMDZ,NP.