IASI δD and q during MJO events

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Introduction

Goals:

- Study IASI q-δD 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-δD dynamics to analyse/improve model physics

This presentation:

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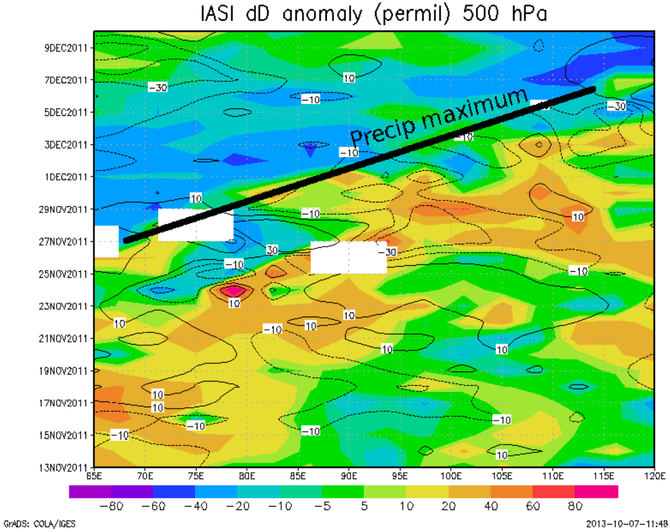
This presentation:

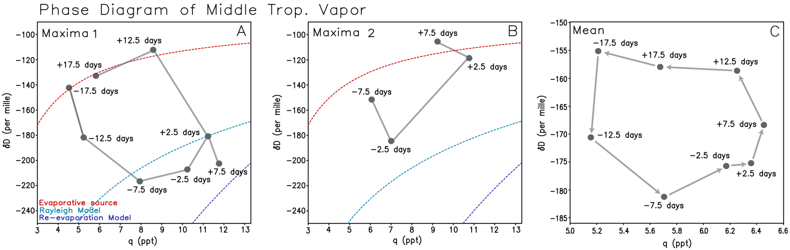
- Use IASI q and δD, compared with strongly guided LMDZ simulations
- Study of Cindy/Dynamo MJO case, nov-dec 2011

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

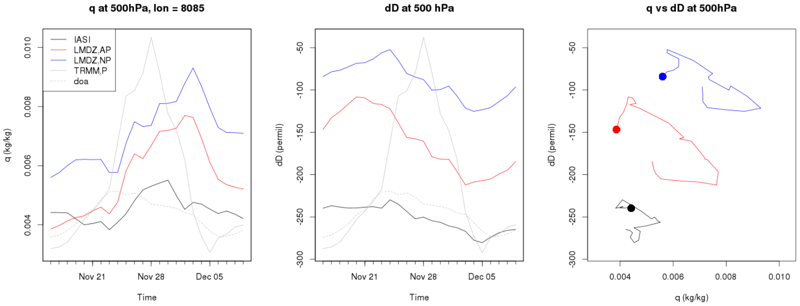


Composite of MJO events

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

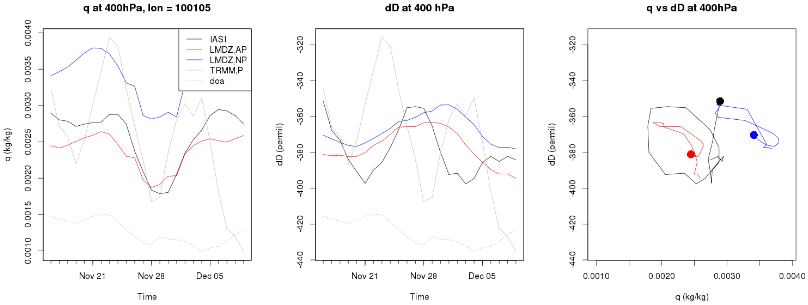


Temporal dynamics at 500 hPa (80-85E)



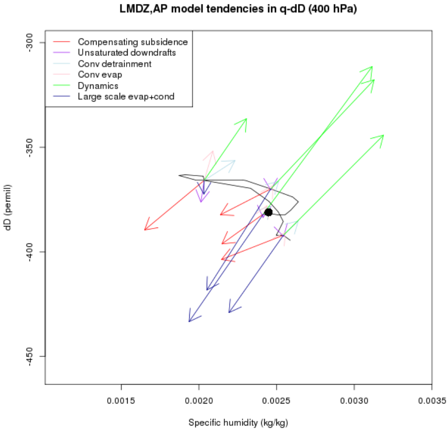
q vs δD MJO cycle opposed to Berkelhammer (2012)

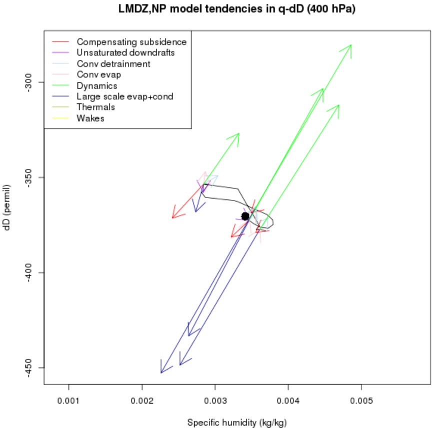
Temporal dynamics at 400 hPa, 100-105E



Phase shift compared to IASI δD, MJO cycle similar to Berkelhammer (2012).

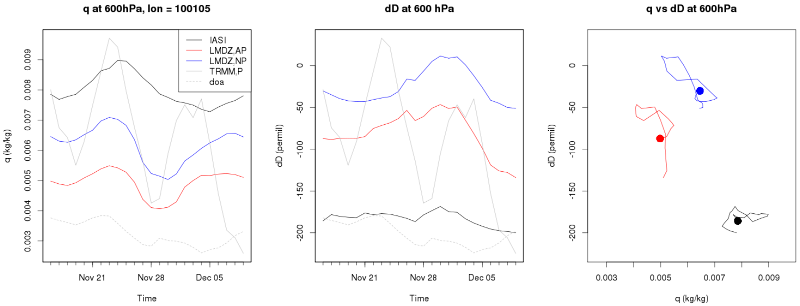
LMDZ tendencies at 400 hPa, 100-105E





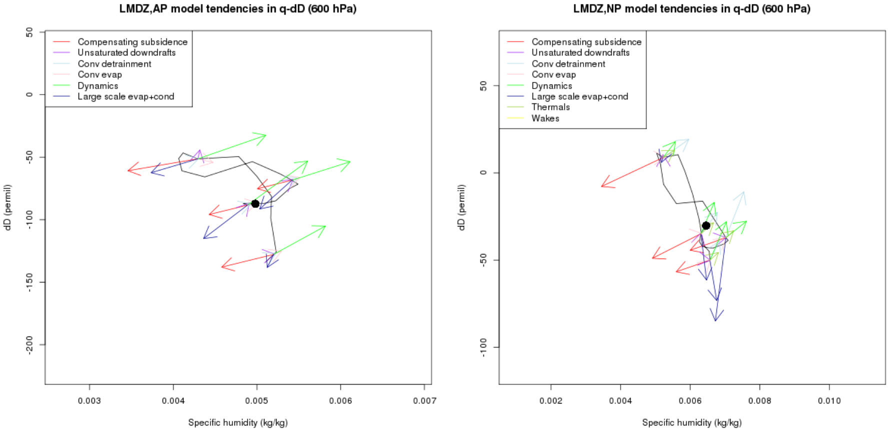
Larger convective tendencies in LMDZ,AP.

Temporal dynamics at 600 hPa, 100-105E



Less δD variability in IASI than in LMDZ.

LMDZ tendencies at 600 hPa, 100-105E



Larger convective tendencies in LMDZ,NP.

Conclusions

- MJO q vs δD cycles are not always like Berkelhammer, 2012
- LMDZ bias in q, δD, but dynamics are reasonable (sometimes with phase-shift)
- LMDZ δD 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