The Vertical Structure of Water Vapor over Taklimakan Desert From COSMIC Observations

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Outline

• Introductions to Taklimakan Desert

• Data used

• The characteristic of the vapor vertical structure

• Coming work
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Introductions

• Taklimakan desert is the largest desert in China.
• Located in Tarim Basin, surrounded by Tianshan Mountains, the Pamirs and Kunlun Mountains.
Introductions

• Taklimakan desert is over 1130km long, over 600km wide.
• The Area of the desert is 337600 km$^2$
Introductions

• As a desert, the average precipitation over Taklimakan desert is 10-40mm a year, most of the precipitations take place from June to August.

• From the record of TAZHONG station, located in the center of the Taklimakan desert

• Annual average precipitation is around 24.7mm

• 247 days below RH 30%

• 318 consecutive days without precipitation

(Zhang.F 2009)
Introductions

- The Water Vapor Distribution
  (using IR channel and ground base GPS)

Introductions

• However, when comes to NECP Reanalysis
One of the reason might be

- The fact that the central part of the desert is *SERIOUSLY* lack of observation!
• Being lack of observations, the characteristic of the vertical structure of water vapor over the desert has **NOT** been described by former researches.

• FORMOSAT-3/COSMIC provide a globe, all-weather profiles of temperature and water vapor pressure by means of RO.
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Data used

• The product start with ‘wetPrf’ is downloaded from High-Level Interface, covered the period from January 1st 2008 to September 29th 2010.

• Over all, 1302 profiles inside the desert area, which is 77E-88.2E, 37.5N-41.5N, were selected to study the characteristics of the water vapor vertical structure.

• A problem occurred when the COSMIC product is used over Taklimakan region.
Data used

• The problem is brought by the method “RO”
Data be assured above
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Could it be cloud?
The CHANCE of abnormal profile:
inside 57% outside 17%
The Reason for it...
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Notice the fact that…
Coming work

- Assumption
- The mid-air water vapor comes from the west to east wind-driven transmission
Conclusions

• The Characteristic of the Vertical Structure of Water Vapor over Taklimakan Desert has never been described before because the lack of observation.

• Using COSMIC product, the abnormal profiles of water vapor over the desert were founded with high chance of appearance.

• The cause of the abnormal profiles might be the west wind-driven water vapor transportations.
Thank for listening
&
Happy 5th anniversary for COSMIC

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