



**ESA-MOST Dragon Cooperation**

中国科技部-欧洲空间局“龙计划”合作

# 2017 DRAGON 4 SYMPOSIUM

2017年“龙计划”四期学术研讨会

26-30 June 2017 | Copenhagen, Denmark

2017年6月26-30日, 丹麦 哥本哈根



# **DRAGON 4 ID. 32301** **(MONITORING GREENHOUSE** **GASES FROM SPACE)** **PROJECT SUMMARY**

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List Pis Dr. Yang Dongxu, Dr. Johanna Tamminen

## Sub-projects and themes:

Id. 32301\_1

Monitoring greenhouse gases from space: retrieval algorithm development and CO<sub>2</sub> and CH<sub>4</sub> flux inversion

Id. 32301\_2

Monitoring greenhouse gases from space: validation and uncertainties with focus in China and high latitudes

## Summary EO data exploitation – cumulative stats all subprojects

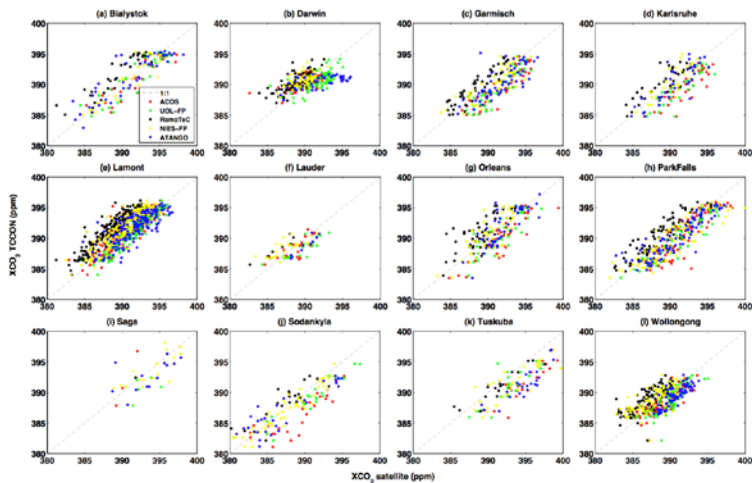
ESA & ESA TPM DATA	Nos. scenes or inform if by FTP	SENTINELS 1, 2 & 3 DATA	Nos. scenes	CHINESE EO DATA	Nos. scenes
ERS SAR		Sentinel 1-A/B SAR		HJ-A/B	
ASAR		Sentinel 2-A/B MSI		GF-1	
MERIS		Sentinel 3-A OLCI		GF-2	
AATSR		Sentinel 3-A SLSTR		HY-A	
SMOS		Sentinel 3-A SLAR		FY-1	
GOSAT, OCO-2	Full archived of L1 and L2 by FTP	Etc.		TanSat	5 T early data
<b>TOTAL</b>		<b>TOTAL</b>		<b>TOTAL</b>	

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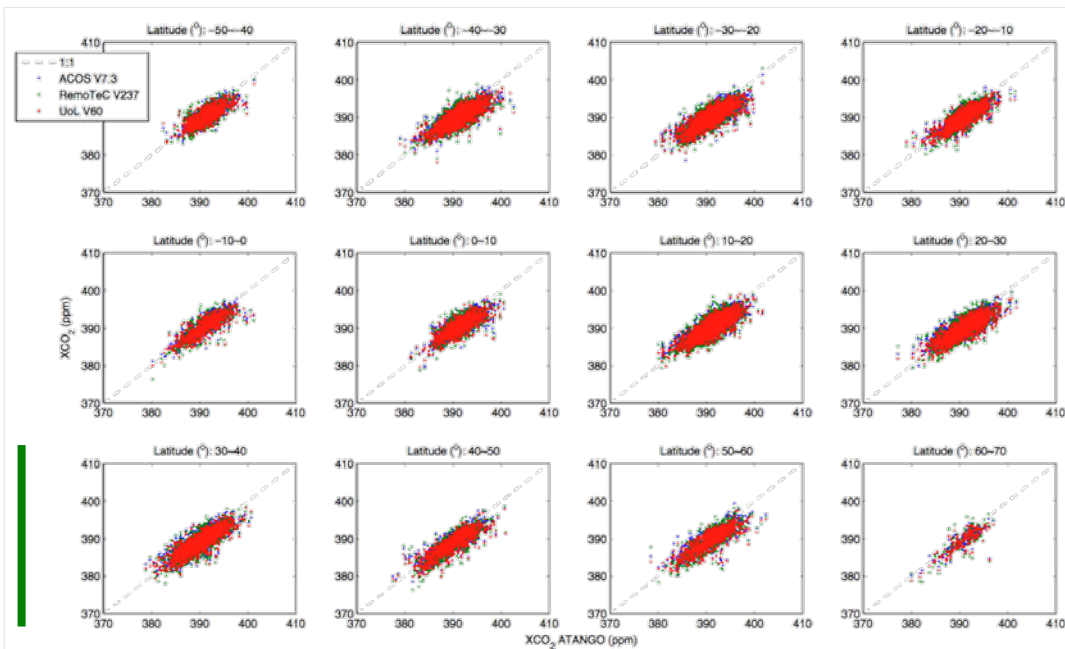
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# Results summary id. 32301\_1

## XCO<sub>2</sub> retrieval inter-comparisons from GOSAT data



**Validation .vs. TCCON**



**Inter-comparison**

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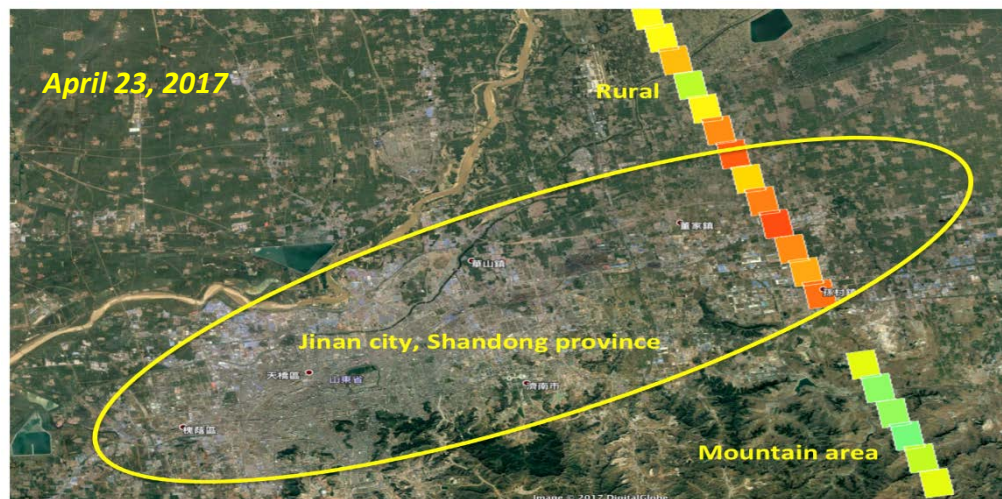
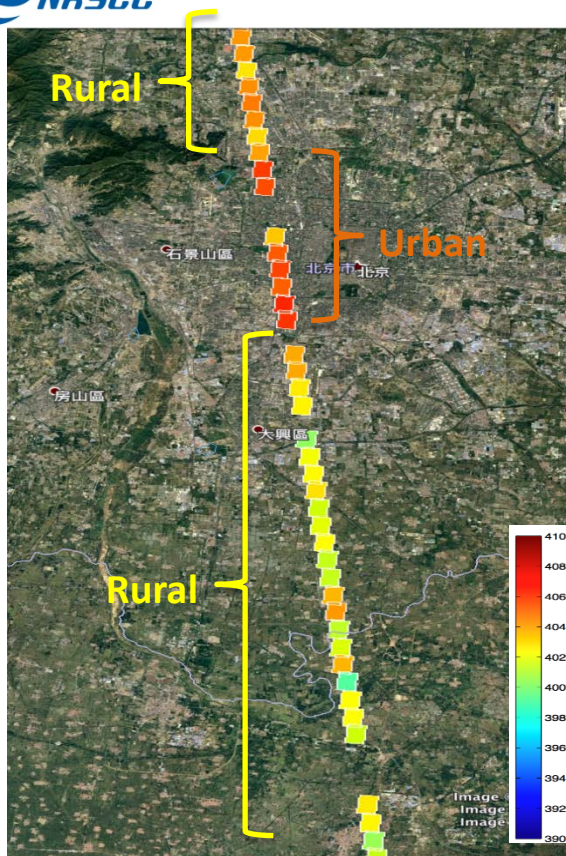
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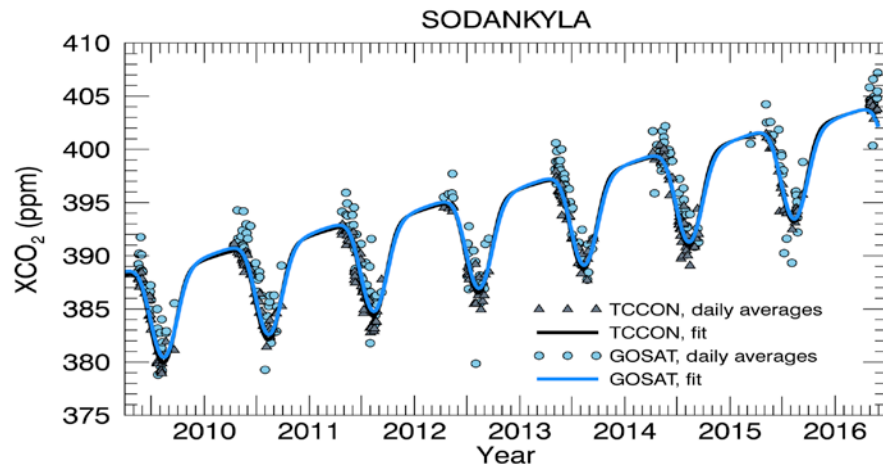
## First TanSat XCO<sub>2</sub> over China

It show there is 3~4ppm variations between the urban and rural area during April 23, 2017.



## Results summary id. 32301\_2

- Sodankylä FTS/TCCON column observations and AirCore profile observations of CO<sub>2</sub> and CH<sub>4</sub> have been used to validate GOSAT and OCO-2 data
- Similar validation is planned for TanSat validation.
- Methodologies for analysing CO<sub>2</sub> anomalies developed - applicable technique for TanSat as well.

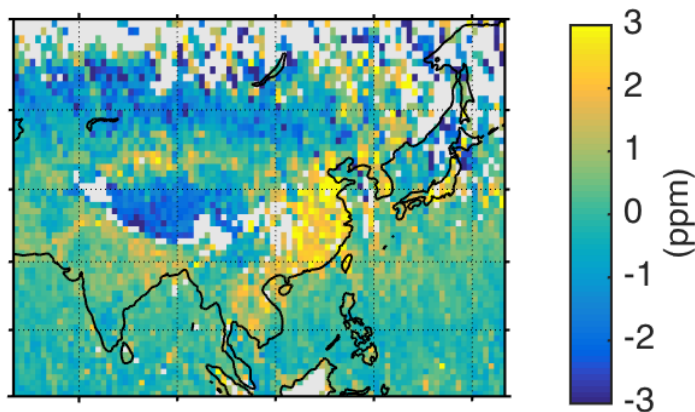


Comparison of dynamically co-located GOSAT (ACOS) and Sodankylä TCCON time series. (Lindqvist et.al.)

# Young scientists contributions

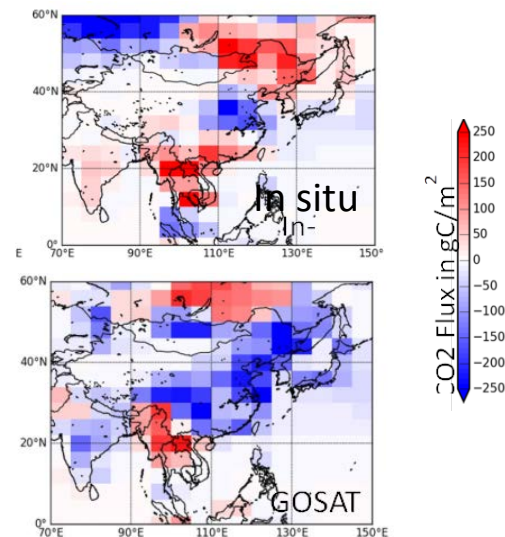
## European YS

XCO<sub>2</sub> anomaly map showing emission areas in Asia  
(from Hakkarainen et.al. 2016, GRL)



## Chinese YS:

CO<sub>2</sub> Flux Inversions from GOSAT





# Academic exchanges & joint publications

## Academic exchanges & cooperation

Provide update & outcomes on

- Team Meeting during IWGGMS-13
- 3 team telecom meetings
- Visiting scientists: Ph D. student Jing Wang visit to Edinburg Univ



## Joint publications

List any publications in press or published

2 publications in preparation phase  
focus on XCO<sub>2</sub> retrieval algorithm and CO<sub>2</sub> flux inversion.



2017年

## Summary on progress and collaboration

GOSAT data retrieval inter-comparison and the result will be published

Then, we will focus on the TanSat and OCO data retrieval

Submitted joint proposals

- to CAS international program,
- to ESA to support Young Scientist,
- to Finnish Academy of Science to support FMI validation activities

## Plans for the next 2 years

TanSat retrieval experiment by Nadir and Target observation on China, Finland and UK surface sites.

Continue CO<sub>2</sub> flux inversion using OCO and TanSat data.

The first AirCore experiment will be conducted in China by IAP and FMI teams

Joint European and Chinese Field campaign to validate TanSat and S5P over China?