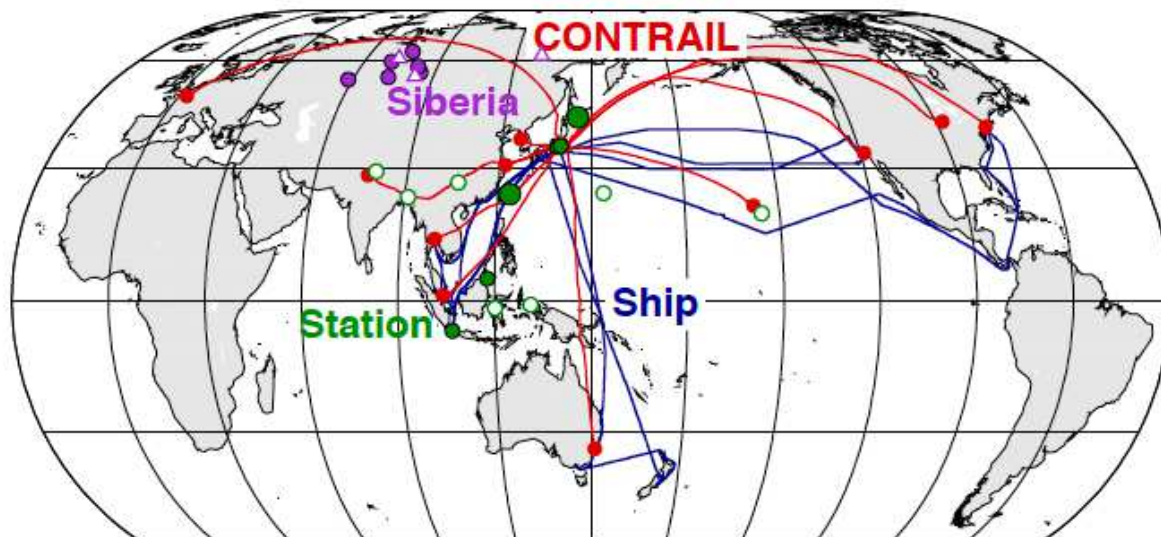


Ground and ship-based remote sensing observations for GOSAT-GW validation and Japan's urban flux estimates

Hiroshi Tanimoto
National Institute for Environmental Studies, Japan

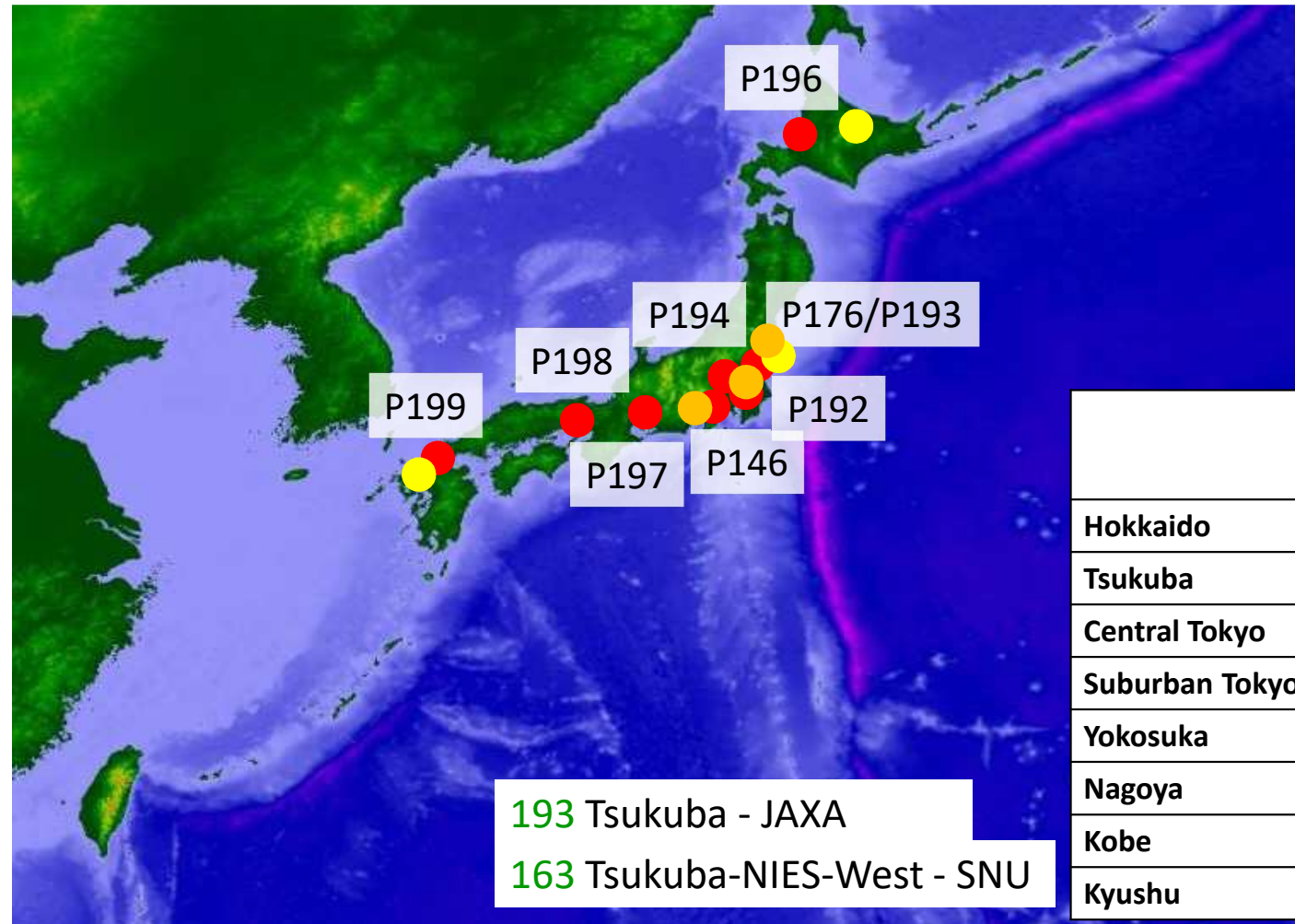
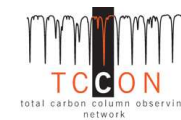
Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan
Heidelberg University, Germany
Forschungszentrum Jülich, Germany
CNRS Toulouse, France
National Central University, Taiwan



NIES observation platforms largely rely on collaborations with private sectors

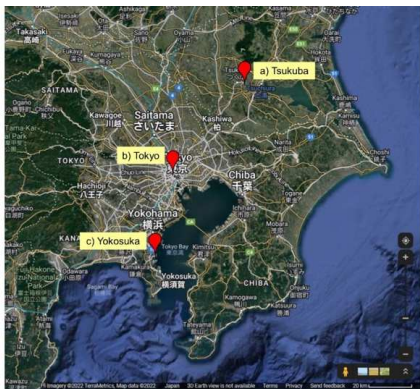
- <https://gosat-gw.nies.go.jp/en/>

Ground-based remote sensing sites



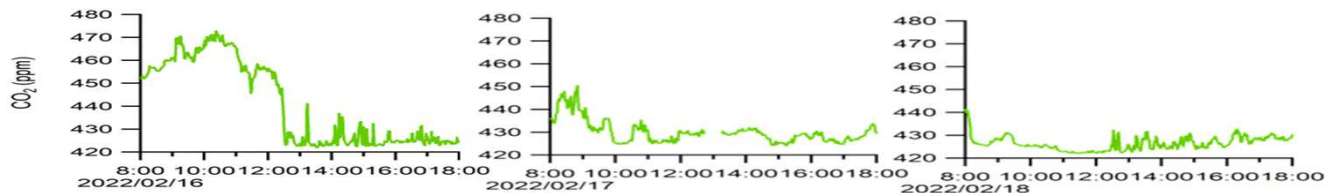
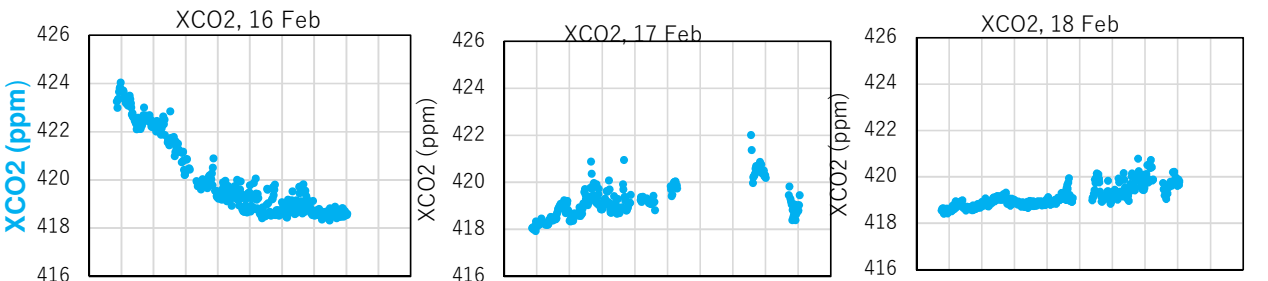
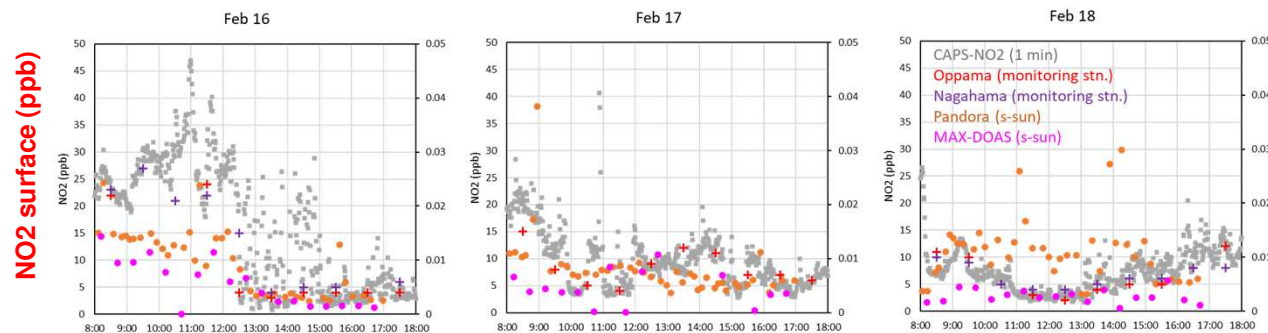
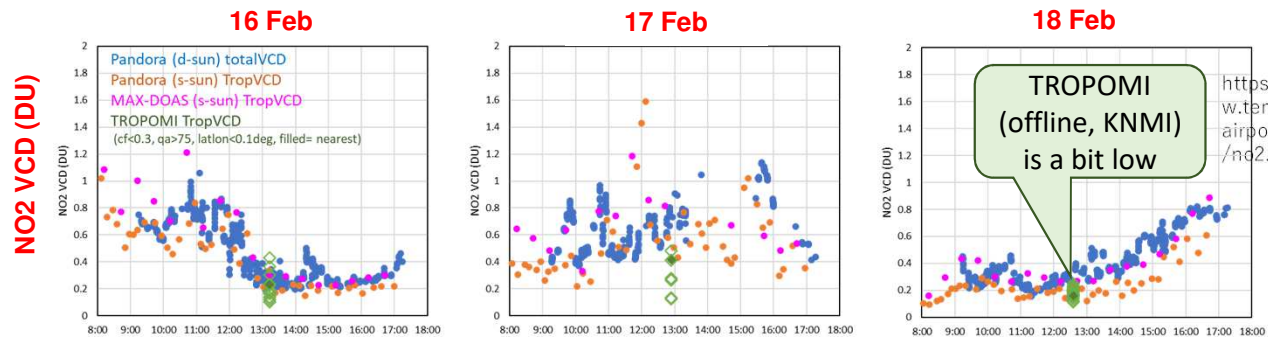
	CO ₂ /CH ₄		NO ₂
	TCCON	COCCON	PGN
Hokkaido	125HR		P196
Tsukuba	125HR	EM27/Sun	P176
Central Tokyo		IN PREP.	P192
Suburban Tokyo			P194
Yokosuka		IN PREP.	P146
Nagoya			P197
Kobe			P198
Kyushu	125HR		P199

Tokyo-Seoul campaign 14-25 Feb 2022 Yokosuka



NO₂ VCDs: Pandora & MAX-DOAS agreed. Small differences from heterogeneity or algorithm characteristics

surface NO₂ estimated from Pandora & MAX-DOAS were lower than true values, needing algorithm elaboration



Yokosuka, XCO₂ (EM27/Sun)

Similar diurnal trend
M. Frey, A. Mueller, P. Patra, T. Miyakawa, Y. Kanaya, I. Morino, H. Tanimoto

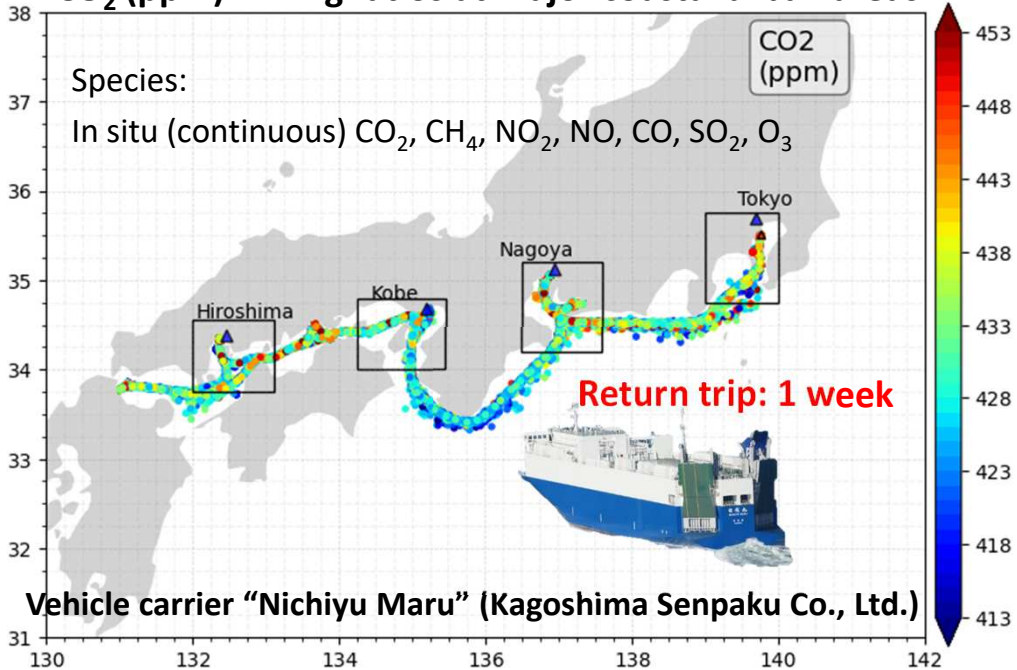
Yokosuka, surface CO₂ (LI-840) similar trend

T. Miyakawa



Cargoship-based monitoring along Japan's east coast

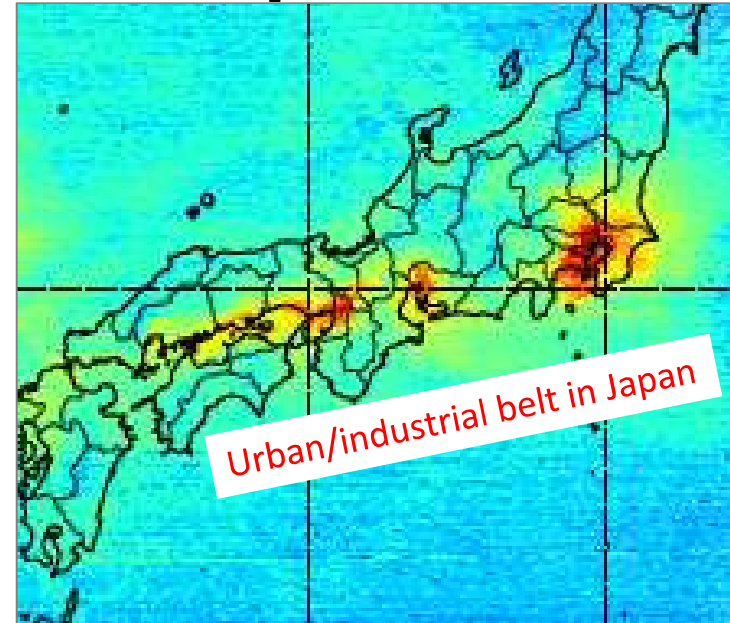
CO₂ (ppm) mixing ratios at major coastal urban areas



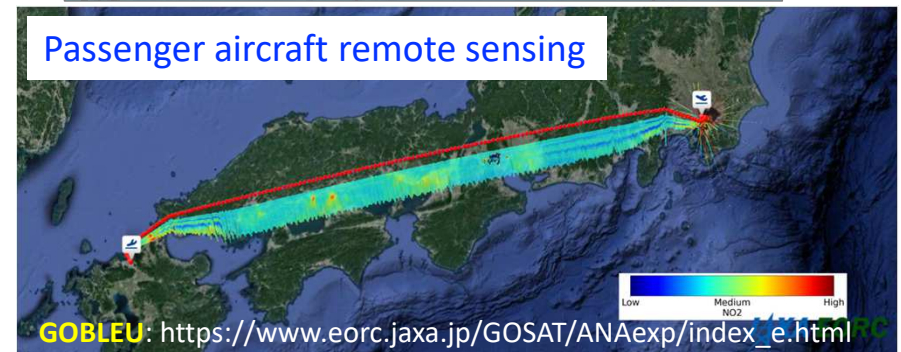
Priyanka Srivastava, work in progress

- Satellite validation
- Continuous emission monitoring of CO₂ & NO_x
- Plume transects from point sources

GEMS L2 v2.0 NO₂ VCD (10¹⁶ molecules/cm²)



Passenger aircraft remote sensing



Onboard observation by FTIR – UV/VIS spectrometer - fully automatic and remotely controlled



UNIVERSITÄT
HEIDELBERG
ZUKUNFT
SEIT 1386



Collaboration: NIES, Japan (Astrid Müller, Matthias Max Frey, Hiroshi Tanimoto, Isamu Morino, Shin-Ichiro Nakaoka), Heidelberg University, Germany (Ralph Kleinschek, Ken von Buenau, Karolin Voss, Vincent Enders, André Butz)



IAGOS Users' meeting
14-16 November
Brussels

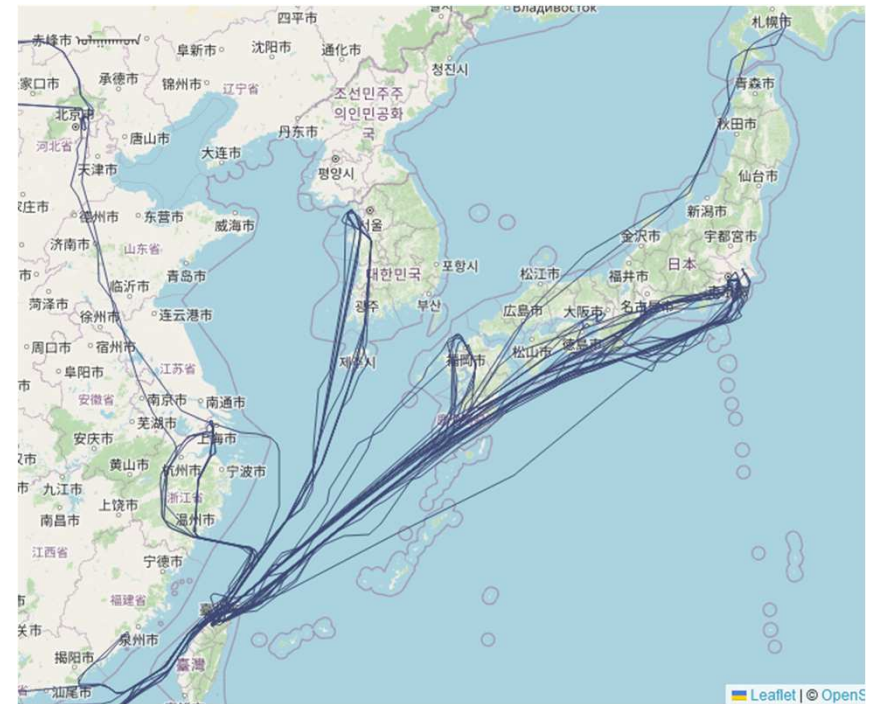
IAGOS NO_x observations on CAL B18316

Christoph Mahnke, Ulrich Bundke, Norbert Houben,
Chris Schleiermacher and Andreas Petzold,
Forschungszentrum Jülich

Philippe Nedelec, CNRS Toulouse

Kuoying Wang, National Central University, Taipei

Hiroshi Tanimoto, NIES, Tokyo



- ➔ On 21 March 2023, acceptance of P2b certification by CAA
- ➔ On 16 June 2023, installation of the IAGOS Package P2b on CAL B18316
- ➔ On 23 August 2023, installation of modified cable in Package 2b to fix an electronic error which stopped P2b operation during flight
- ➔ 24 August 2023, start of measurements
- ➔ Since beginning of measurements, we collected data from 58 flights
- ➔ Last flight is from 12 September
- ➔ Flights cover triangle Taipei – Tokyo - Shanghai

