

**Federal Service for Hydrometeorology
and Environmental Monitoring**



**VOEIKOV
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OBSERVATORY**

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Greenhouse gas observations at HMO Tiksi: Comparison of measurement techniques of NOAA/ESRL, FMI and MGO

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Greenhouse gases measurements at station Tiksi are made by four programs:

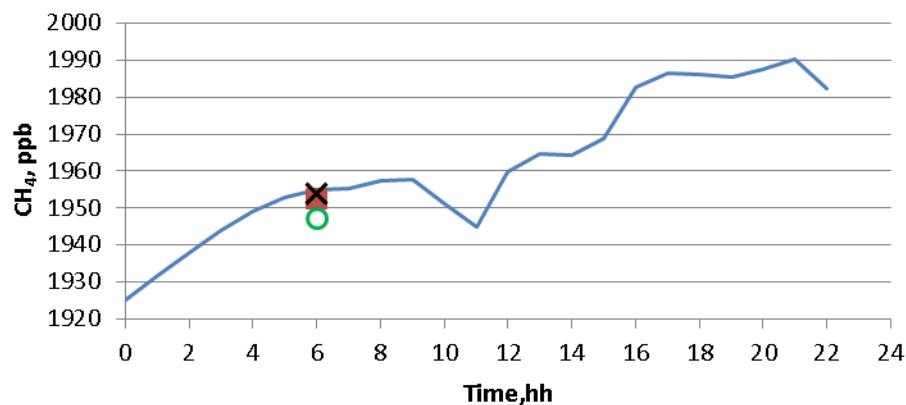
	Measurement program	Method of air samples collection	Height of air samples collection	Measurement method	Calibration
1	Continuous CO ₂ and CH ₄ concentration measurements, established by FMI		10m	CRDS	CCL standards
2	NOAA/ESRL flask sampling program	flushing and then pressurizing glass flasks with a pump	10m	NDIR for CO ₂ GC-FID for CH ₄	CCL standards
3	MGO flask sampling program by using NOAA glass flasks (MGO-N)	flushing and then pressurizing glass flasks with a pump	10m	NDIR for CO ₂ GC-FID for CH ₄	CCL standards
4	MGO flask sampling program by using MGO stainless steel flasks (MGO)	opening a stopcock on an evacuated flask	2m	NDIR for CO ₂ GC-FID for CH ₄	CCL standards

Clean Air Facility where the Greenhouse gas observations are performed



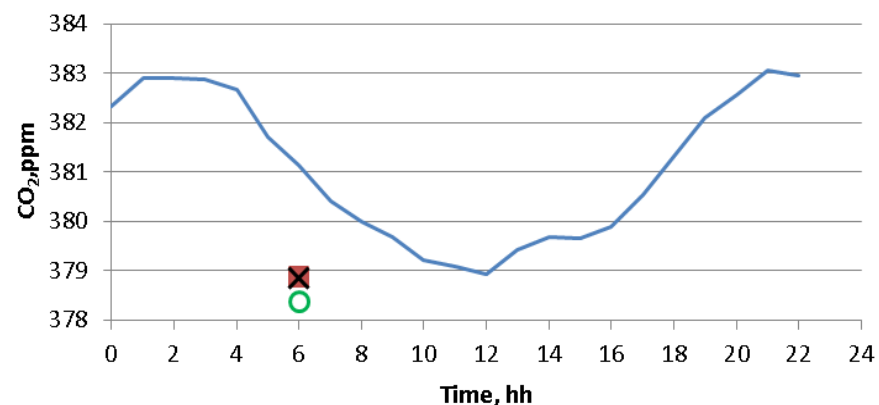
Comparison of continuous (FMI) and flask (NOAA, MGO) measurements of CO₂ and CH₄ mixing ratio

15.08.11



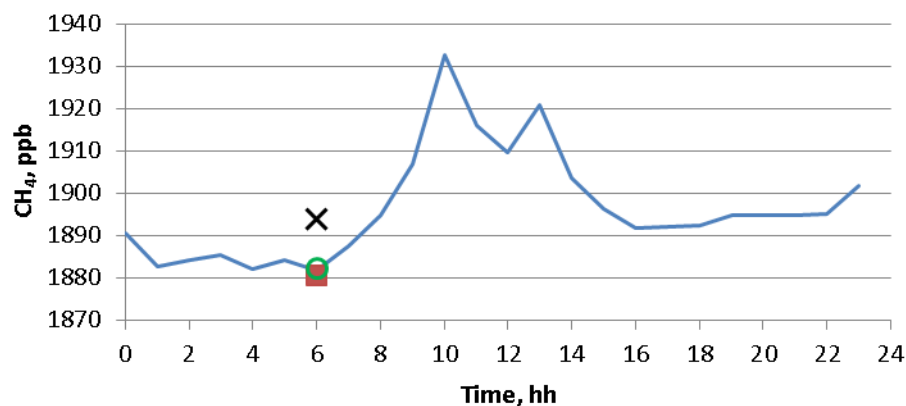
— FMI ■ NOAA ○ MGO_N × MGO

15.08.11



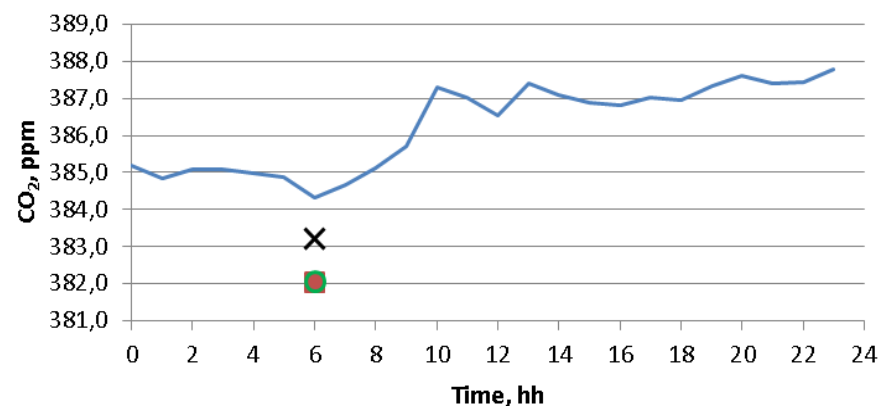
— FMI ■ NOAA ○ MGO_N × MGO

12.09.11



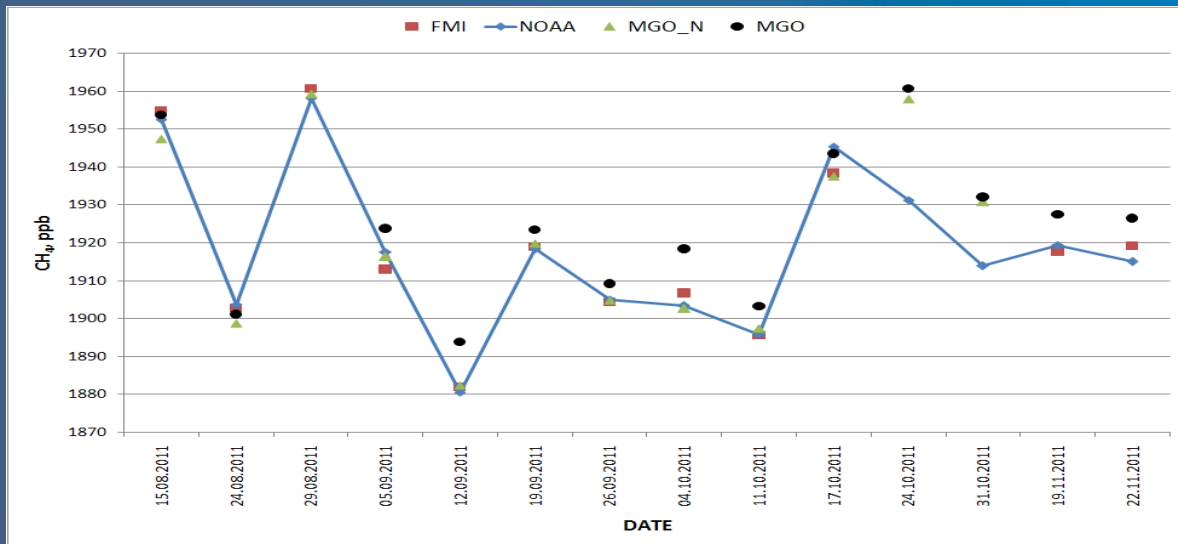
— FMI ■ NOAA ○ MGO_N × MGO

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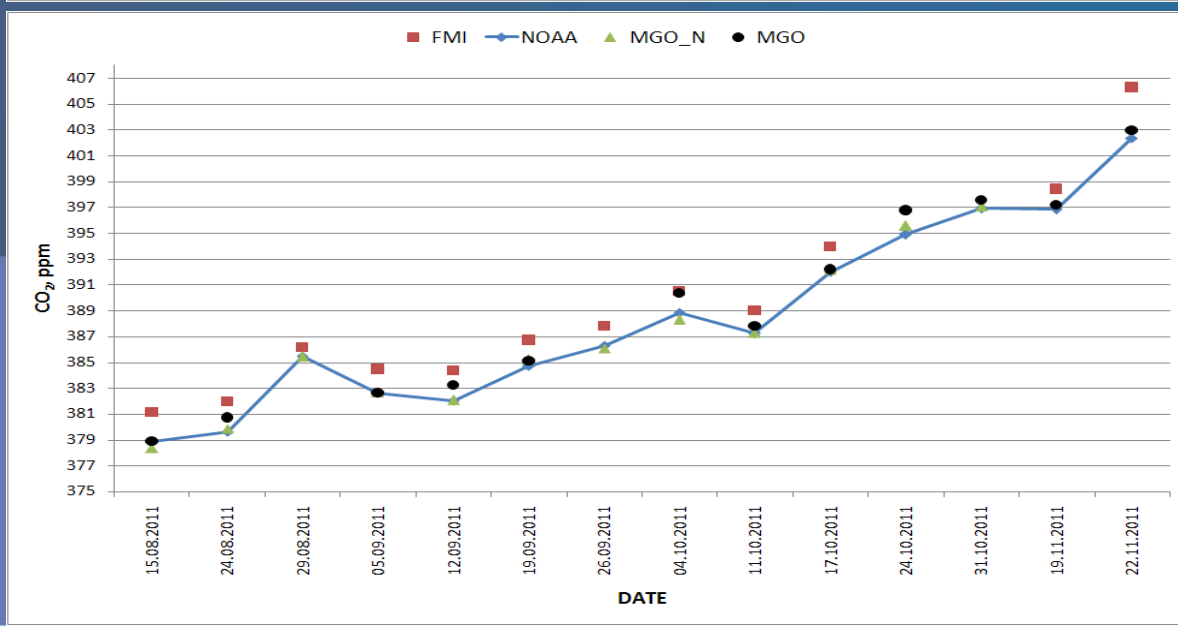


— FMI ■ NOAA ○ MGO_N × MGO

Comparison of continuous (FMI) and flask (MGO) concentration data with available NOAA measurement results

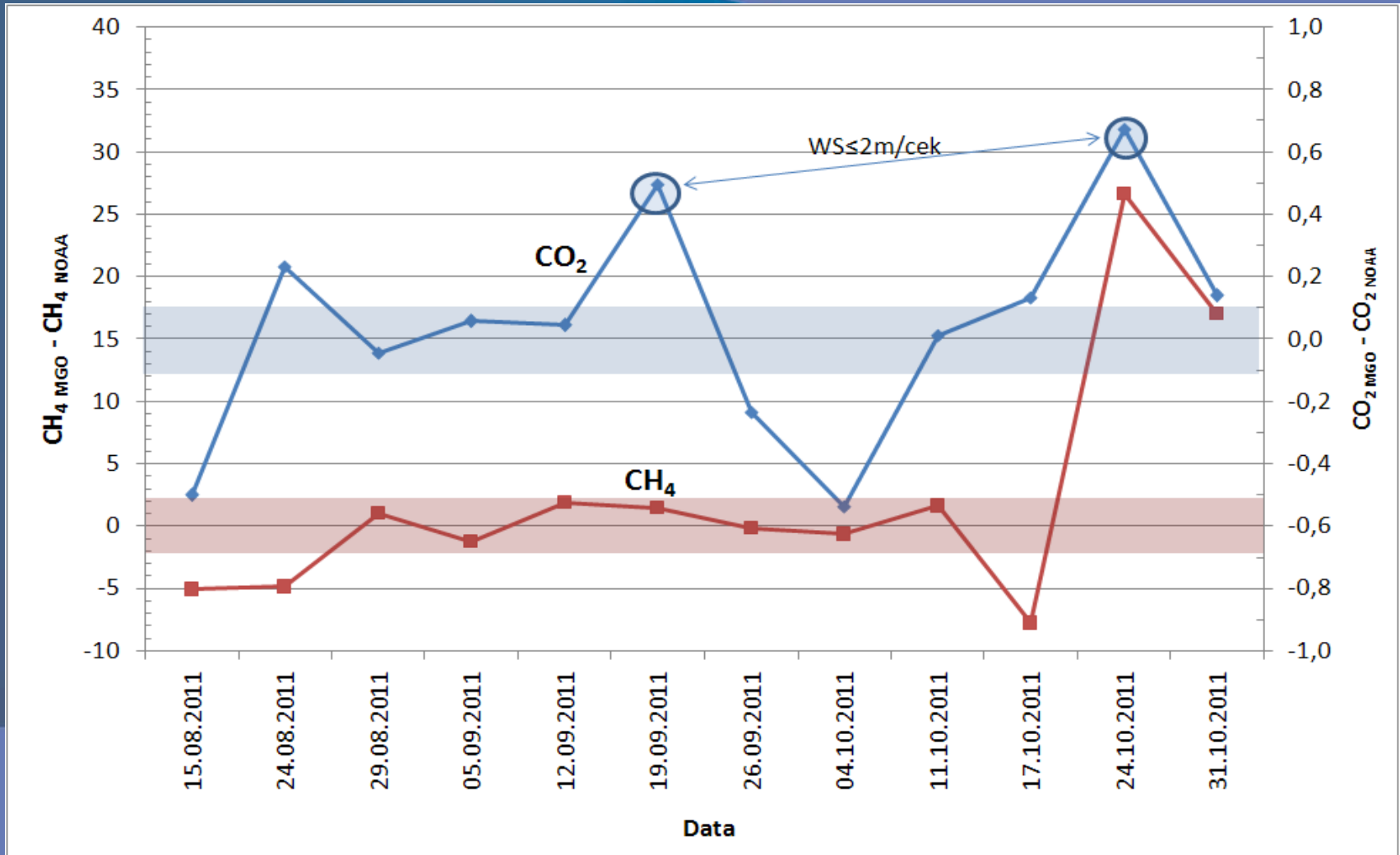


	CH ₄ , ppb	
	AVG	STD
FMI-NOAA	0.3	3.1
MGO-N-NOAA	-1.4	3.4
MGO-NOAA	5.3	6.1
MGO-FMI	-1.2	4.4



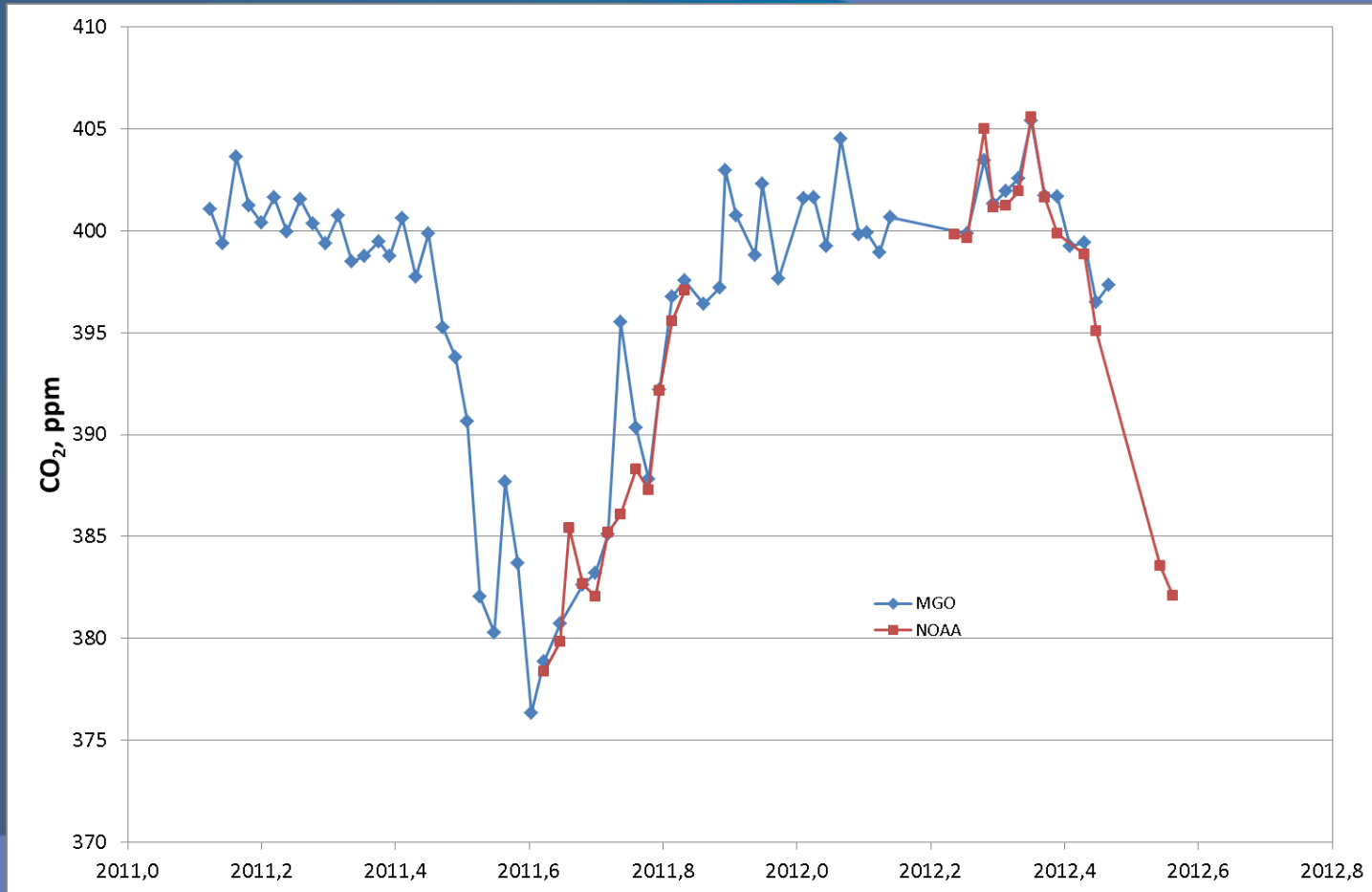
	CO ₂ , ppm	
	AVG	STD
FMI-NOAA	1.99	0.77
MGO-N-NOAA	0.04	0.35
MGO-NOAA	0.70	0.60

Deviation of MGO from NOAA measurement results in simultaneously sampled NOAA glass flasks



The areas allocated with color correspond to requirements of WMO for comparability of data

CO₂ measurements at Tiksi station



Regular MGO flask sampling started at February 2011
From April 2012 NOAA glass flasks are used on a regular basis



Thank you for your attention !

