



Lanyu (Island) Station – New Horizons of the western Pacific Ocean in background atmospheric chemistry and radiation observations



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Introduction

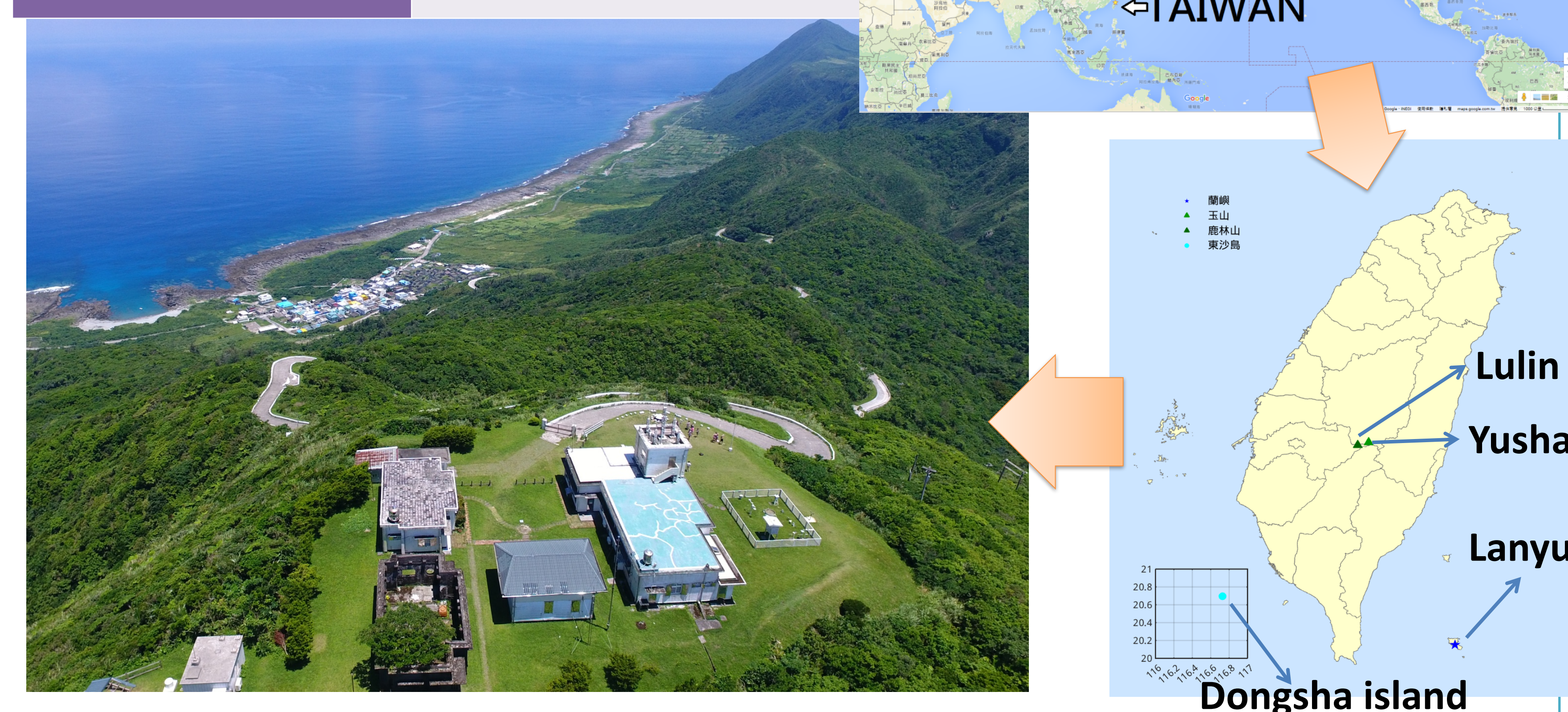
Lanyu meteorological station (22.04°N, 121.56°E; 324m) is located at the peak area of Lanyu Island in the offshore 70 km of eastern Taiwan. Because of its special geographic location, the site is characterized to clean maritime environment and the forefront of typhoon watch. The weather station was built by Japanese in 1940 for typhoon monitoring propose in the beginning. Later in 1947, the Central Weather Bureau (CWB) started to carry on the routine meteorological observations and continue to present.

Since 1995, the CWB initial the in-situ measurements for atmospheric compositions (i.e., carbon dioxide, nitrogen oxide, ozone, sulfur dioxide, and carbon monoxide) in order to respond to WMO's recommendation. The review of 20 years long data record from Lanyu site will be presented in this presentation. In general, the data quality is good and the magnitudes in a reasonable range. The CO₂ trend shows in good agreement with other background stations (i.e., Lulin, Dongsha Island). Occasionally, the influence of anthropogenic sources, such as ship emission, has also discovered in the data set. In order to remove the outliers, we performed a statistical method to remove the contamination from pollution events and calculated the baseline values for each species. The baseline values provide us the preliminary understanding of background atmospheric condition in the western Pacific Ocean.

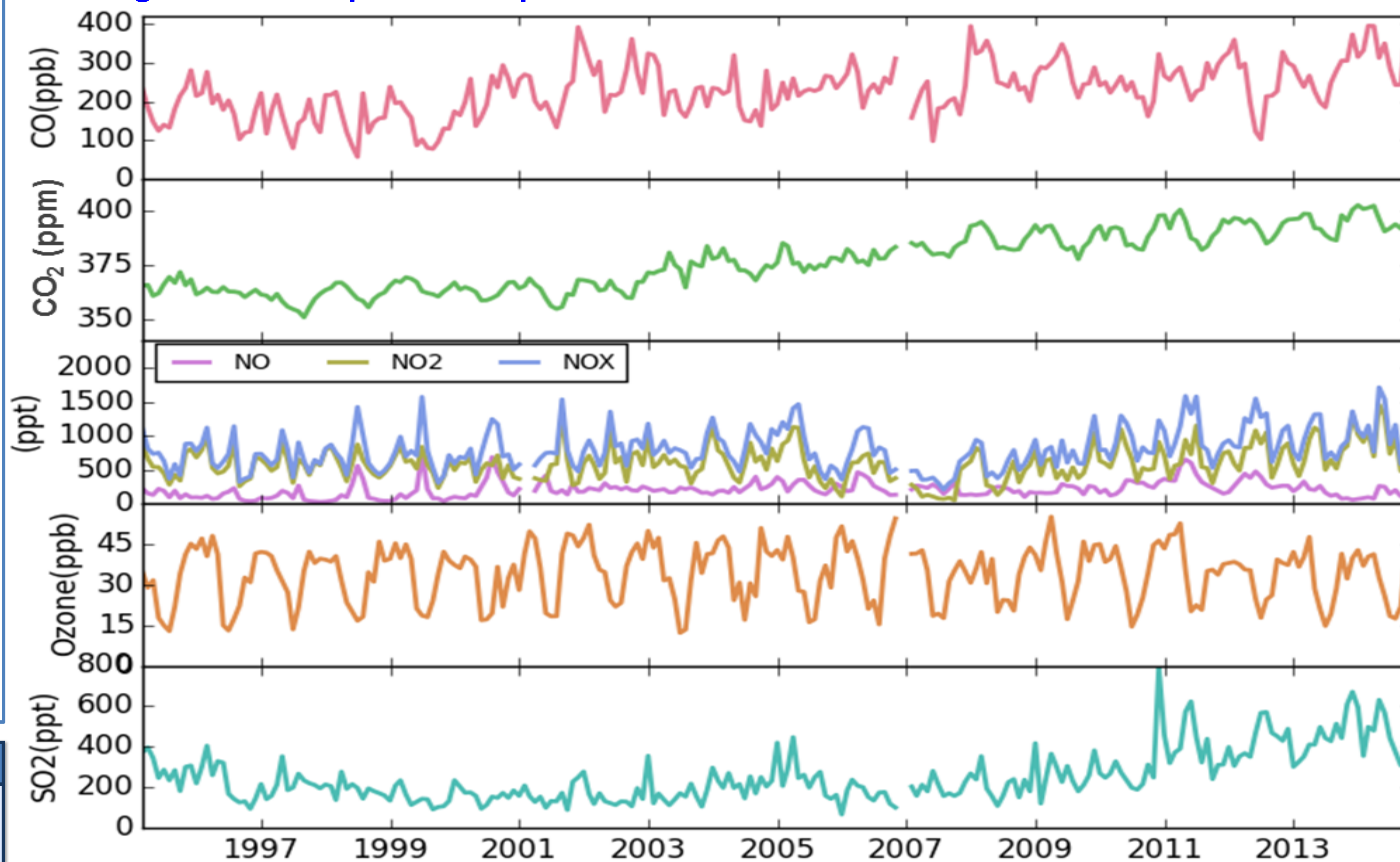
For the future plan, we purpose to upgrade in-situ measurements and to set up a high quality radiation observation in Lanyu site. The site will continue provide high standard data and serve as an international collaboration platform in the science community.

1. Location

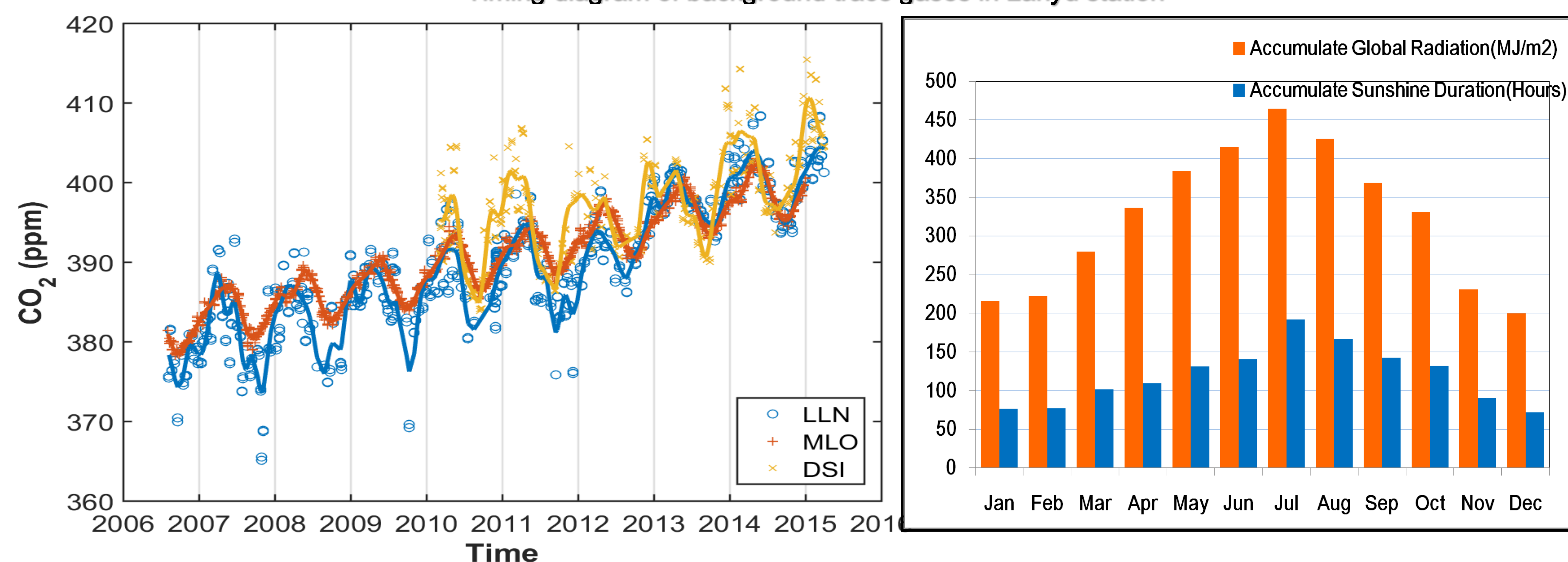
Station name:	Lanyu Weather Station
Station number:	46762
Longitude:	121.56° N
Latitude:	22.04° E
Elevation:	324 meters



2. Background Atmospheric Compositions



Timing diagram of background trace gases in Lanyu station



Distribution results of Carbon Dioxide(CO₂) in Lulin, Mauna Loa, and Dongsha stations

Solar radiation of Lanyu Weather Station(1981-2016)

	Parameter	Instrument	Period
Background Atmospheric Chemistry	SO ₂	THERMO 43iTL	Mar. 1995 ~ now
	NO/NO ₂ /NO _x	THERMO 42iTL	
	O ₃	THERMO 49i	
	CO	ECOTECH EC9830T	
	CO ₂	ECOTECH EC9820	
Meteorological Conditions	Temperature	MetOne T-200	Jan. 1952 ~ now
	Humidity	MetOne DP-200B	Mar. 1953 ~ now
	Wind	R.M.Young	Jan. 1952 ~ now
	Pressure	Setra 270	Jan. 1951 ~ now
	Rainfall	Takeda TK-1	Oct. 1950 ~ now
	Visibility	Biral SWS-250	Jan. 2016 ~ now
	Sunshine Duration	EKO MS-93	Aug. 1953 ~ now
	Global Solar Radiation	EPPLEY PSP	Jan. 1993 ~ now
Radiation (under construction)	Global Solar Radiation	Kipp&Zonen CMP21	-
	Long Wave Radiation	Kipp&Zonen CGR4	-
	Direct Solar Radiation	Kipp&Zonen CHP1	-
	Photosynthetically Active Radiation (PAR)	Kipp&Zonen PQS1 PAR	-
	UVB	Kipp&Zonen UVS-B-T UV	-
	UVE	Kipp&Zonen UVS-E-T UV	-