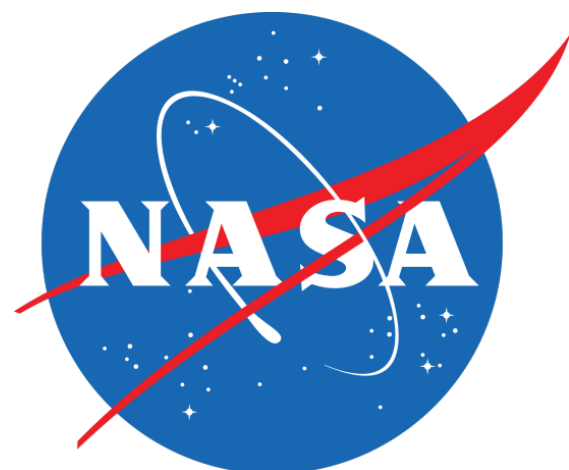




Airborne Measurements of DMS and SO2 at Tropical Latitudes

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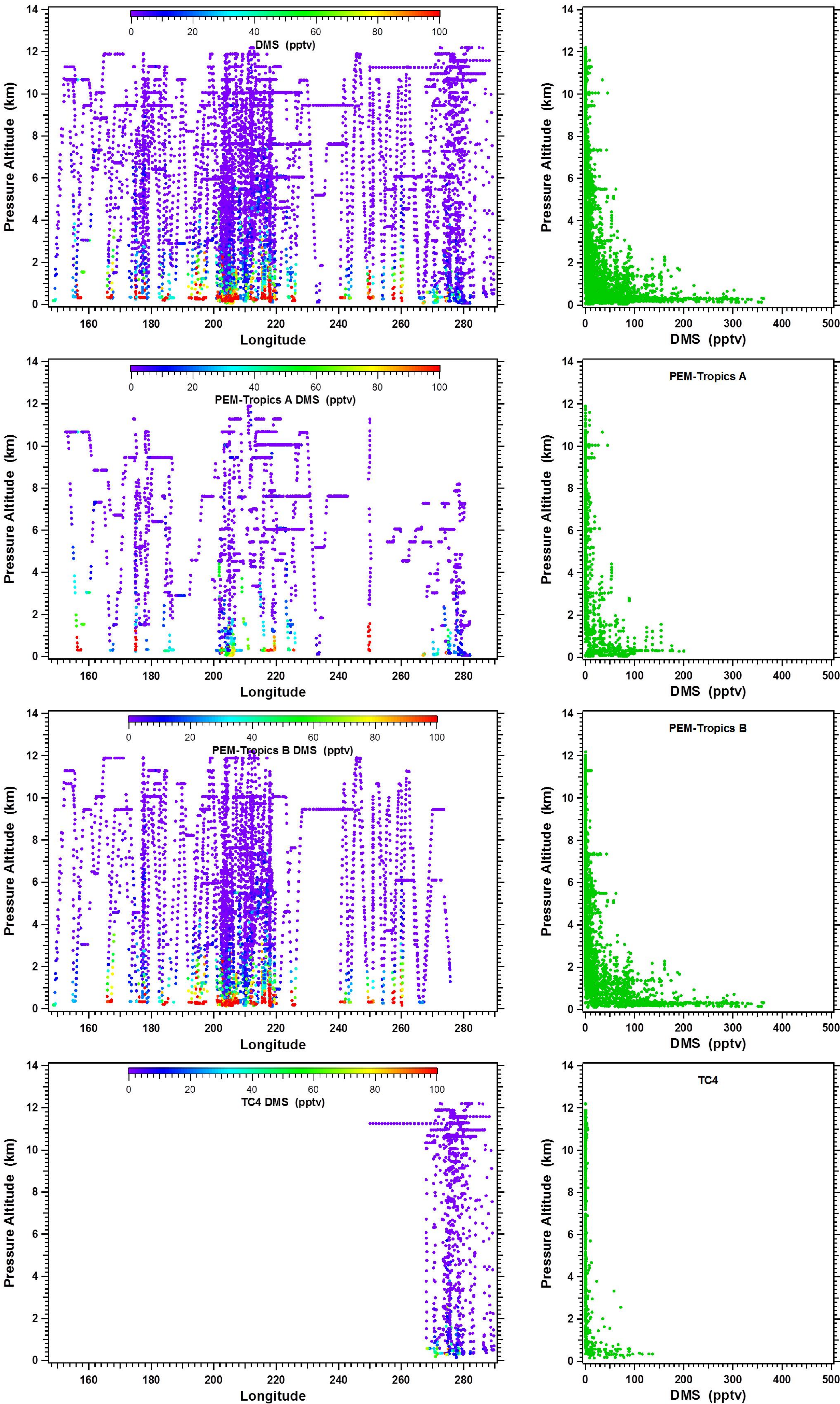


Background: The tropical DMS and SO2 data are from NASA Pacific Exploration in Tropical Pacific Phase A and Phase B (PEM-Tropics A and PEM-Tropics B) as well as Tropical Composition, Cloud and Climate Coupling (TC4).

- Sampling time: PEM-Tropics A: August – September 1996; PEM-Tropics B: March-April 1999; TC4: July 2007
- Aircraft platform: P-3B and DC-8 both PEM-Tropics A and PEM-Tropics B; DC-8 for TC4. Data above 8 km were collected from DC-8 aircraft.
- PEM-Tropics A and PEM-Tropics B were operated in exploratory mode while TC4 was primarily focused on sampling tropical convection outflow.
- TC4 SO2 data were average into 3 min time interval to increase precision.

Summary of NASA Airborne DMS and SO2 Measurements

Mission	Aircraft	DMS Measurement					SO2 Measurement				
		Investigator	Technique	Avg. Time	Uncertainty	LOD (pptv)	Investigator	Technique	Avg. Time	Uncertainty	LOD (pptv)
PEM-Tropics A	P3-B	A. Bandy	GC/MS	300 S	Accuracy: 10% precision: > 5%	1	A. Bandy	GC/MS	300 S	Accuracy: 10% precision: > 5%	1
	DC-8	A. Bandy	GC/MS	300 S	Accuracy: 10% precision: > 5%	1	A. Bandy	GC/MS	300 S	Accuracy: 10% precision: > 5%	1
PEM-Tropics B	P3-B	A. Bandy	GC/MS	300 S	Accuracy: 10% precision: > 5%	1	A. Bandy	GC/MS	300 S	Accuracy: 10% precision: > 5%	1
	DC-8	D. Blake	GC/MS	~60 S	Accuracy: 10% precision: 5-10%	1	R. Talbot	MC/IC	~360 S	Accuracy: 10-20% precision: 15-35%	10
TC4	DC-8	D. Blake	GC/MS	~60 S	Accuracy: 10% precision: 5-10%	1	P Wennberg	CIMS	< 1 S	50% + 175 pptv	



Summary of DMS Vertical Distributions in Percentiles

Alt Range (km)	All Data					PEM-Tropics A					PEM-Tropics B					TC4				
	0.05	0.25	0.5	0.75	0.95	0.05	0.25	0.5	0.75	0.95	0.05	0.25	0.5	0.75	0.95	0.05	0.25	0.5	0.75	0.95
8 – 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 – 10	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 – 11	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1

Summary of SO2 Vertical Distributions in Percentiles

Alt Range (km)	All Data					PEM-Tropics A					PEM-Tropics B					TC4				
	0.05	0.25	0.5	0.75	0.95	0.05	0.25	0.5	0.75	0.95	0.05	0.25	0.5	0.75	0.95	0.05	0.25	0.5	0.75	0.95
8 – 9	11.0	20.0	26.0	36.0	54.8	8.8	13.7	21.0	36.0	47.0	13.0	21.0	27.0	35.0	54.0	10.5	25.8	43.0	72.1	142.3
9 – 10	8.8	12.2	18.0	26.1	49.5	8.8	11.7	15.8	20.8	29.2	9.0	13.0	19.0	29.8	52.0	5.5	25.8	43.5	90.0	139.1
10 – 11	10.0	15.0	20.6	29.0	76.6	8.8	13.3	17.4	21.0	28.4	10.0	14.6	21.0	28.0	40.8	16.0	37.7	62.7	93.3	153.8
> 11	8.5	15.0	24.1	52.0	121.8	8.0	11.5	15.4	19.1	62.4	8.5	15.0	23.0	40.0	66.0	18.9	50.7	72.8	114.3	174.1