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SUPPLEMENTARY INFORMATION

2 **Sources and Long-term Variability of Carbon Monoxide at** 3 **Mount Kenya and in Nairobi**

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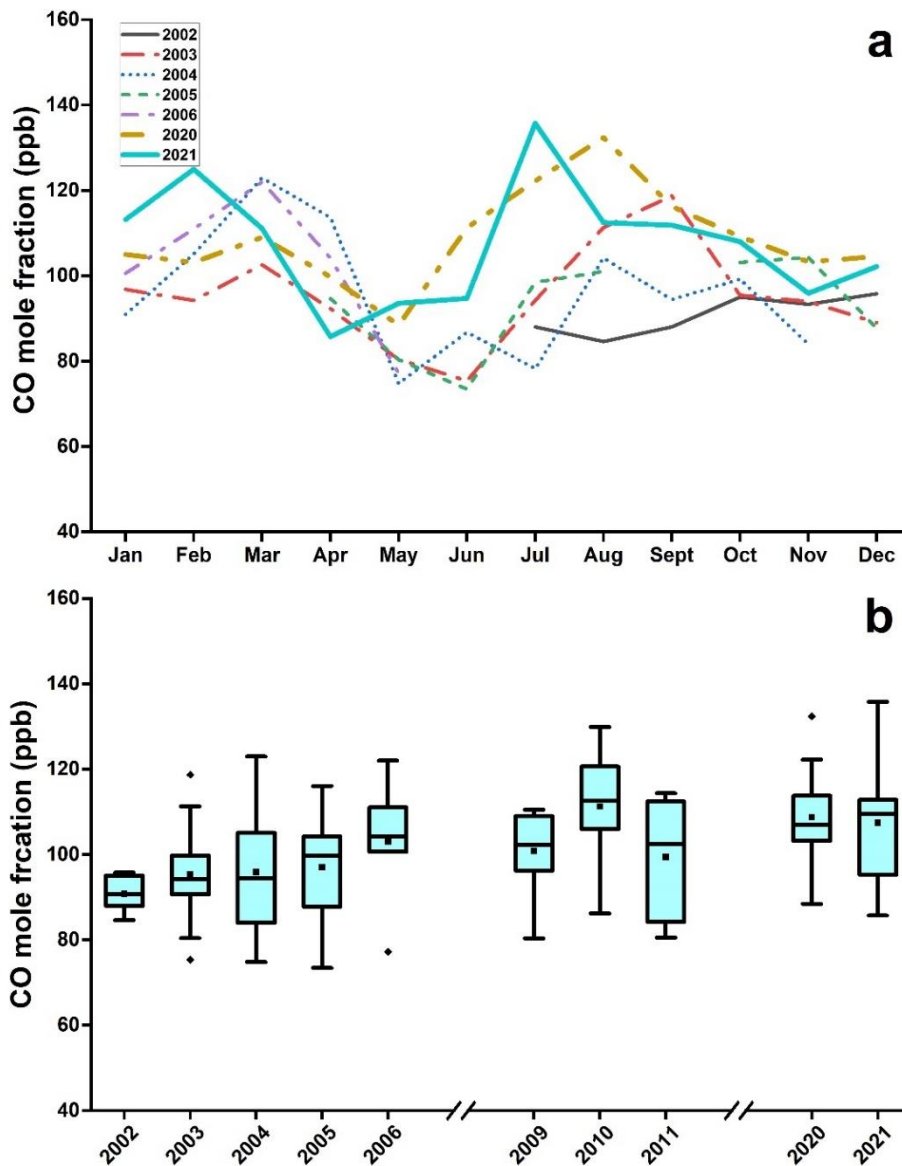
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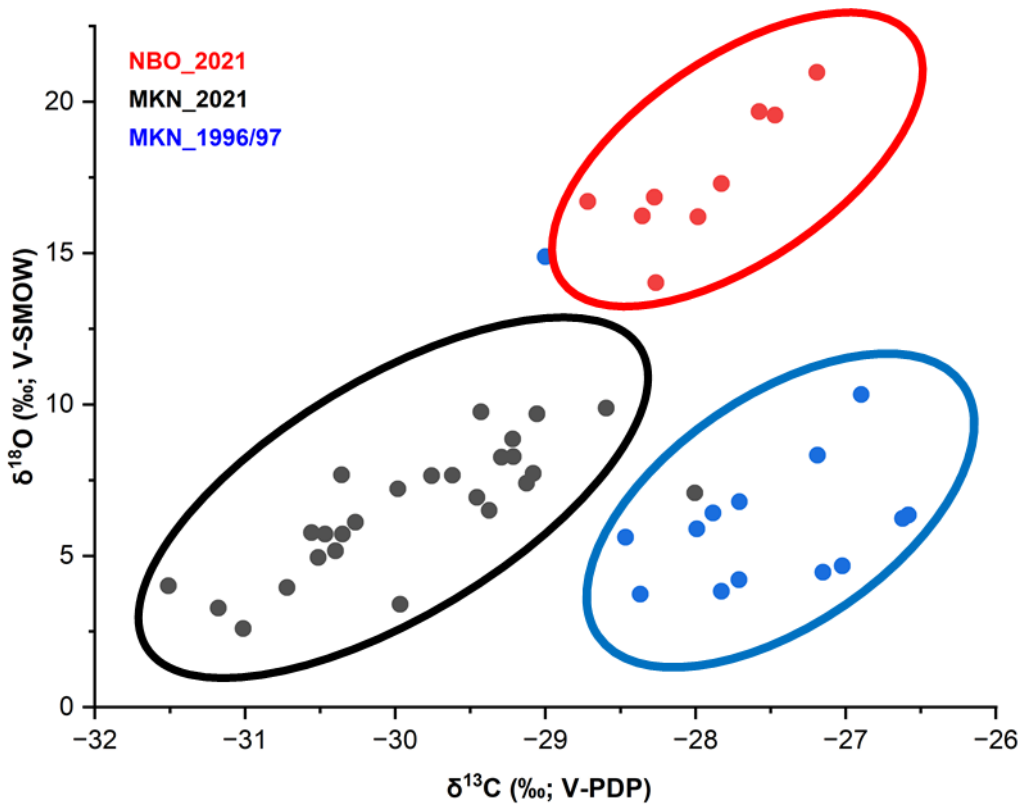
17 **Supplementary information includes: 3 Figures and 3 Tables**

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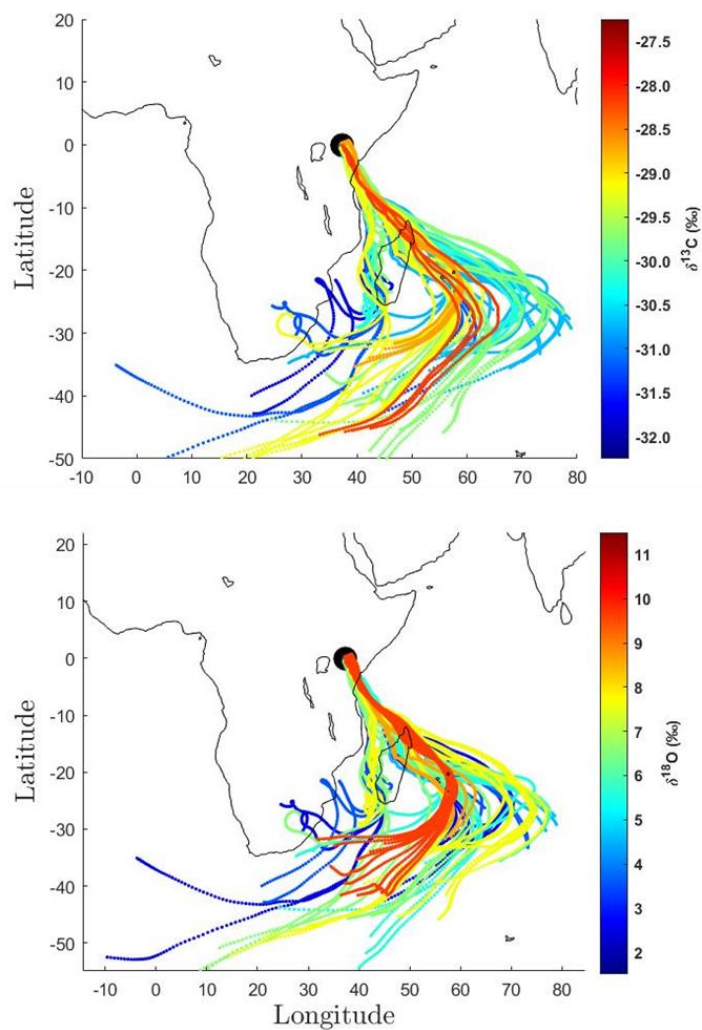
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30 Figure S1: Long-term trend in CO concentrations at Mt. Kenya GAW station; a) inter-annual cycles of monthly
31 averaged CO mole fractions (coloured lines represent individual years), and b) annual averaged CO mixing ratios. The
32 CO data was retrieved from the WMO's-WDCGG database covering 2002 to 2021. Different instrumentations were
33 used over time, but similar instrumental calibration, quality control, and assurance protocols were applied. Large data
34 gaps, e.g., 2007 - 2020, were attributable mainly to instrument failure, data quality issues, and/or power disconnections.
35 The boxes represent the 25th and 75th quantiles, and the black line represents the median value. The bottom/top whiskers
36 are the minimum and maximum values, respectively, while diamonds represent the outliers.



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38 Figure S2: Stable isotopes composition of CO for ambient air samples collected on Mt. Kenya in 1996/97 (blue), at Mt.
 39 Kenya GAW in 2021 (black), and in Nairobi (red).



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42 **Figure S3: 10 days HYSPLIT air masses back trajectories at Mt. Kenya GAW generated every six hours and at an**
43 **arrival height of 100 m during the glass sampling campaign (10-30th August 2021). The back trajectories are colour-**
44 **coded to their respective isotopic signatures ($\delta^{13}\text{C}$ on the top, $\delta^{18}\text{O}$ on the bottom panel).**

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46 **Supplementary Figures**

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48 **Table S1: Sample details and stable isotope composition for 2021 campaign. Ambient air samples were collected in**49 **Nairobi and at Mt. Kenya GAW station.**

Date	Sampling time	CO (ppb)	13C-CO (V-PDB)	d18O - CO (V-SMOW)
2021-08-10	Night-time	93	-29.4	6.5
2021-08-11	Night-time	91	-31.2	3.3
2021-08-12	Night-time	126	-29.2	8.9
2021-08-13	Night-time	84	-30.7	4.0
2021-08-14	Night-time	93	-30.5	5.0
2021-08-15	Night-time	110	-29.5	6.9
2021-08-16	Night-time	112	-29.8	7.7
2021-08-17	Night-time	99	-31.5	4.0
2021-08-18	Night-time	58	-31.0	2.6
2021-08-19	Night-time	103	-29.1	7.4
2021-08-20	Night-time	111	-29.2	8.3
2021-08-21	Night-time	108	-28.0	7.1
2021-08-22	Night-time	98	-29.3	8.3
2021-08-23	Night-time	64	-30.0	3.4
2021-08-24	Night-time	89	-30.4	7.7
2021-08-25	Night-time	83	-30.3	6.1
2021-08-26	Night-time	82	-30.6	5.8
2021-08-27	Night-time	130	-29.4	9.8
2021-08-28	Night-time	131	-29.1	9.7
2021-08-29	Night-time	148	-28.6	9.9
2021-08-12	Day time	92	-30.4	5.2
2021-08-16	Day time	98	-30.5	5.7
2021-08-22	Day time	99	-29.1	7.7
2021-08-24	Day time	75	-30.4	5.7
2021-08-27	Day time	93	-29.6	7.7
2021-08-29	Day time	101	-30.0	7.2
2021-08-10	Day time	277	-28.4	16.2
2021-08-12	Day time	539	-27.6	19.7
2021-08-14	Day time	583	-27.5	19.6
2021-08-16	Day time	557	-27.2	21.0
2021-08-18	Day time	356	-28.3	16.9
2021-08-20	Day time	265	-28.0	16.2
2021-08-22	Day time	250	-28.7	16.7
2021-08-24	Day time	263	-27.8	17.3
2021-08-26	Day time	194	-28.3	14.0

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52 **Table S2: Sample details and stable isotope composition for 1996/97 campaign. Ambient air samples were collected on**
 53 **Mt. Kenya.**

Date	Duration	CO (ppb)	d¹³C (V-PDB)	d¹⁸O (V-SMOW)
1996-07-29	Day time	157.0	-27.71	6.79
1996-07-30	Day time	197.2	-26.90	10.33
1996-07-31	Day time	169.6	-27.19	8.33
1996-08-01	Day time	365.1	-29.00	14.88
1996-08-20	Day time	140.9	-27.99	5.89
1996-08-20	Day time	135.4	-27.88	6.42
1996-09-25	Day time	193.5	-26.62	6.23
1996-09-25	Day time	200.1	-26.58	6.35
1997-01-10	Day time	121.4	-27.71	4.22
1997-01-10	Day time	120.1	-27.83	3.83
1997-02-06	Day time	144.4	-27.02	4.67
1997-02-06	Day time	139.2	-27.15	4.46
1997-09-10	Day time	123.70	-28.37	3.74
1997-09-10	Day time	135.40	-28.47	5.61

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