



*Supplement of*

## **Sources and long-term variability of carbon monoxide at Mount Kenya and in Nairobi**

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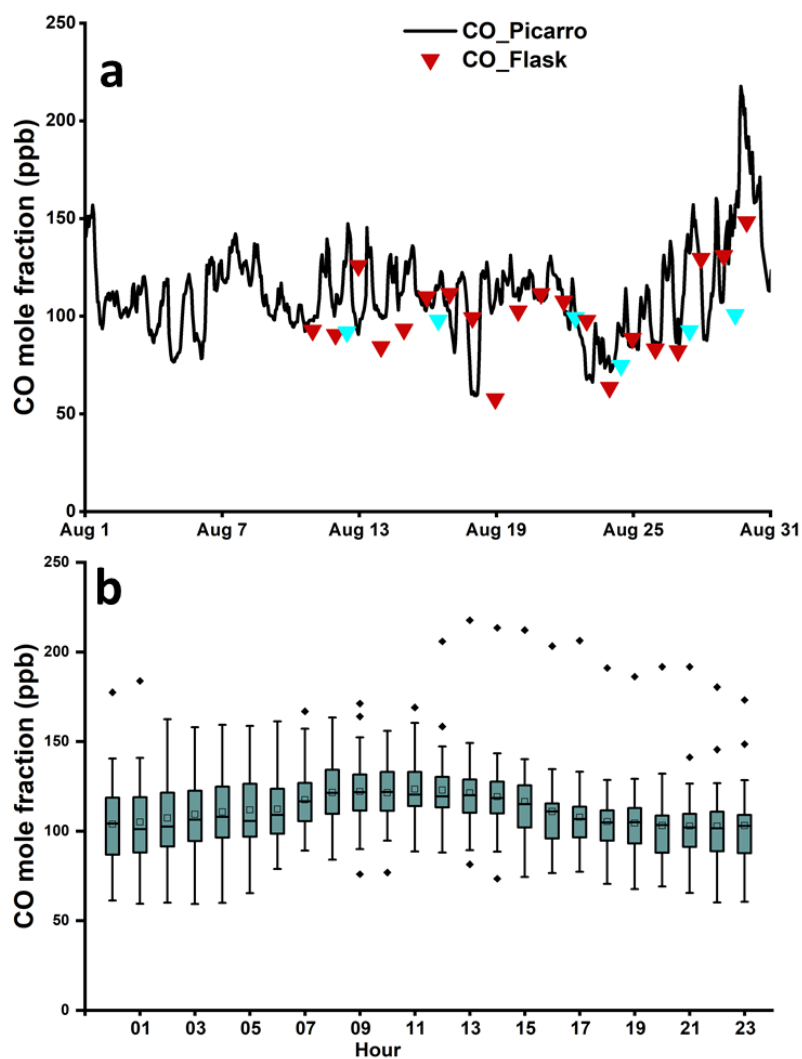
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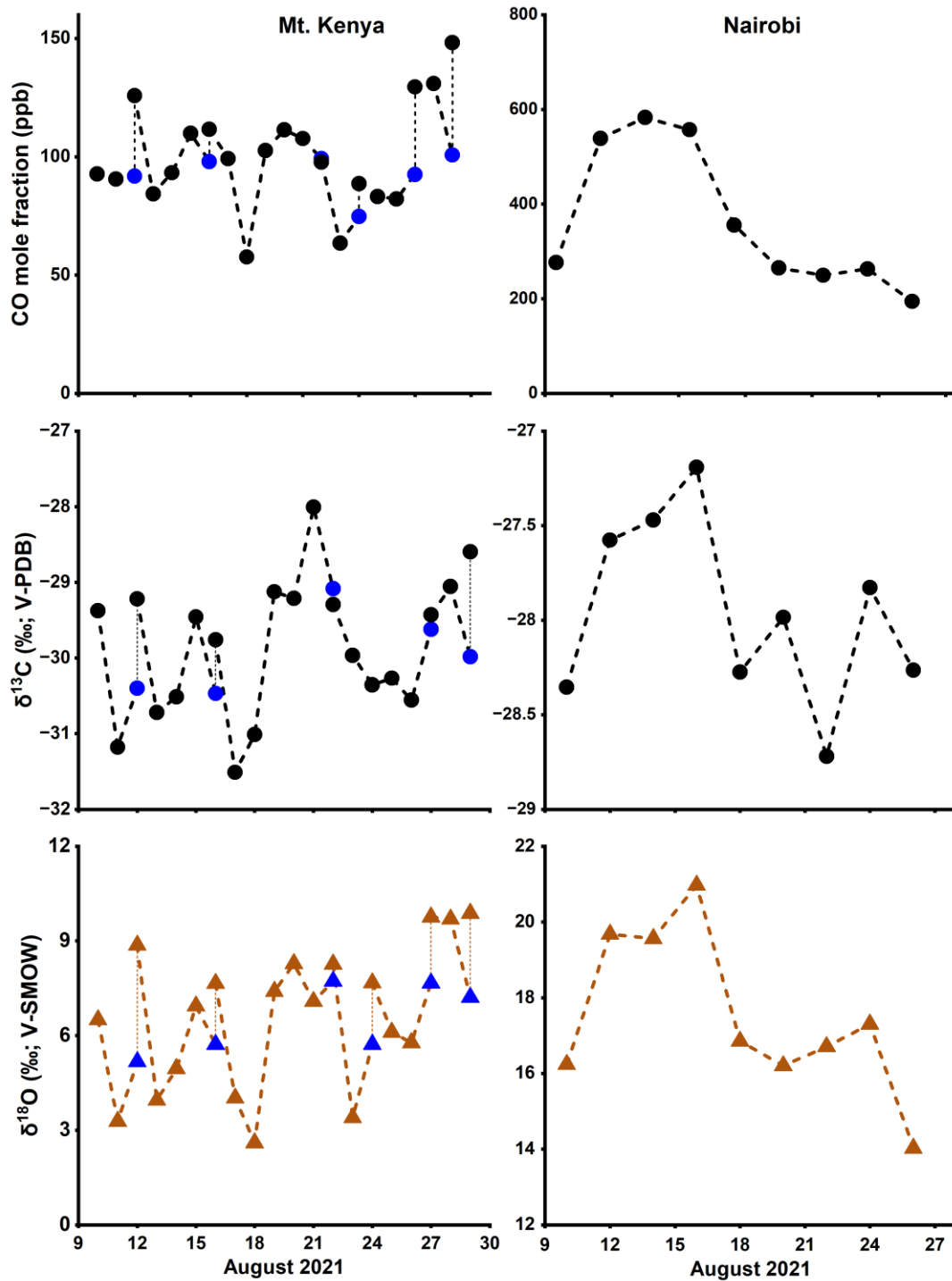
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34 **Supplementary Figures**



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36 **Figure S1: Temporal and diurnal trends of CO at Mt. Kenya GAW station for August 2021. a) Comparison between Picarro**  
37 **G2401 and flask-based CO measurements show good agreement for the study period. B) The diurnal trend of CO**  
38 **characterised by daytime maxima.**

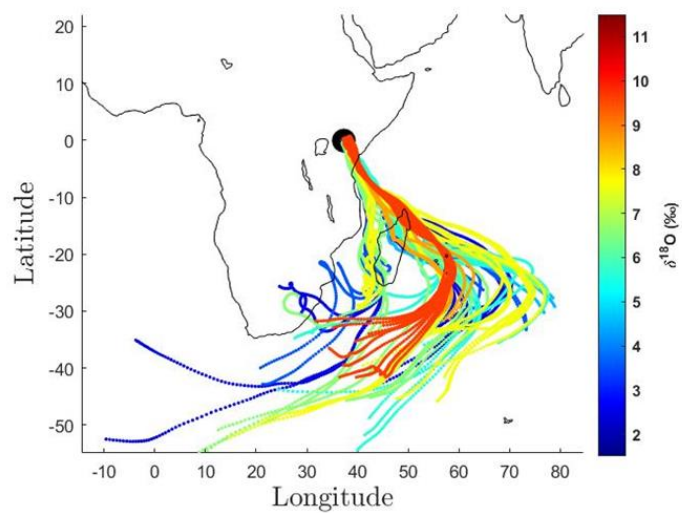
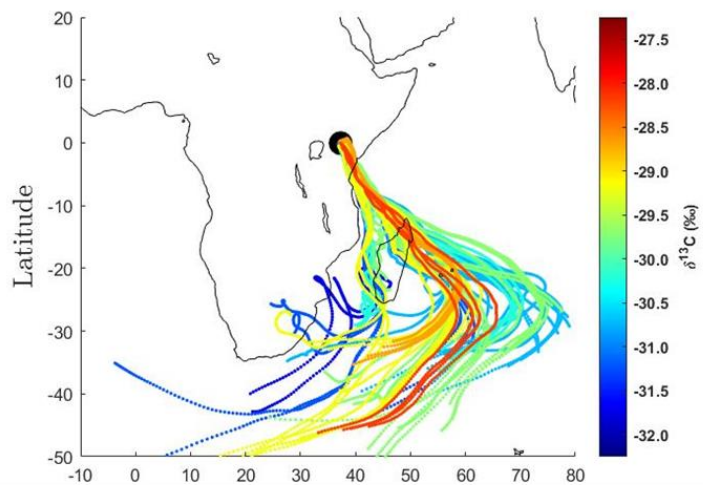


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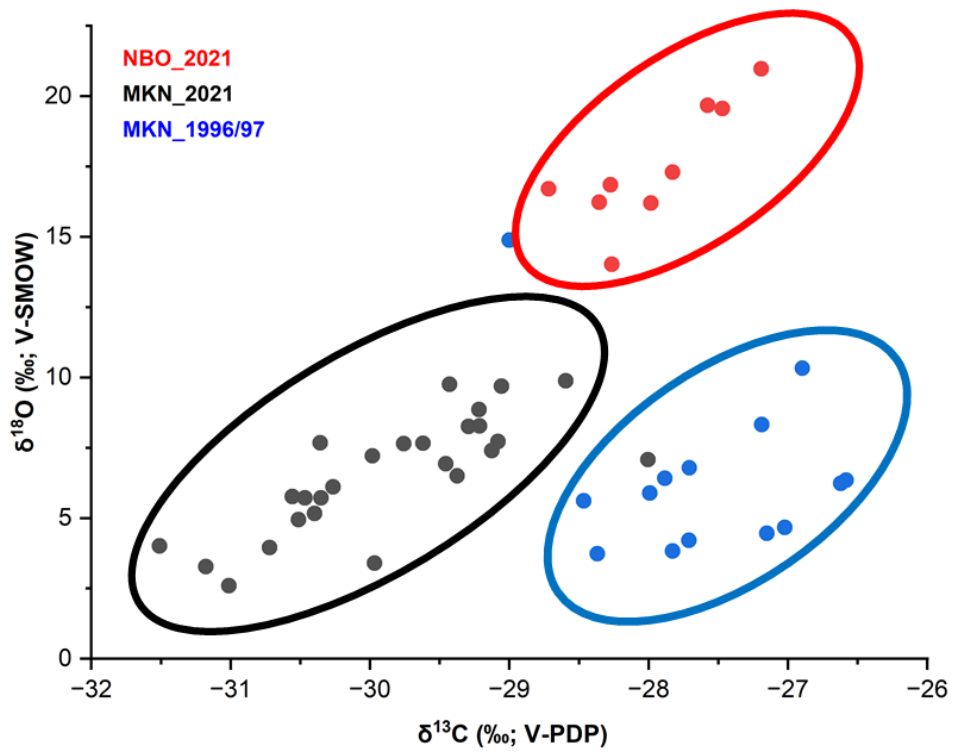
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Figure S2: The CO mole fractions and dual-isotope ( $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$ ) composition at Mt. Kenya GAW and in Nairobi for the 2021 flask sampling campaign.



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



46

47 Figure S4: Stable isotopes composition of CO for ambient air samples collected on Mt. Kenya in 1996/97 (blue), at Mt.  
 48 Kenya GAW in 2021 (black), and in Nairobi (red).

49 **Supplementary Tables**

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

<b>Date</b>	<b>Sampling Time</b>	<b>CO (ppb)</b>	<b><math>\delta^{13}\text{C}</math> (‰ V-PDB)</b>	<b><math>\delta^{18}\text{O}</math> (‰ V-SMOW)</b>
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

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53 **Table S2: Sample details and stable isotope composition for 2021 campaign. Ambient air samples were collected in Nairobi.**

<b>Date</b>	<b>Sampling Time</b>	<b>CO (ppb)</b>	<b><math>\delta^{13}\text{C}</math> (‰ V-PDB)</b>	<b><math>\delta^{18}\text{O}</math> (‰ V-SMOW)</b>
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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55 **Table S3: Sample details and stable isotope composition for 1996/97 campaigns. Ambient air samples were collected on Mt.**  
 56 **Kenya.**

<b>Date</b>	<b>Duration</b>	<b>CO (ppb)</b>	<b><math>\delta^{13}\text{C}</math> (V-PDB)</b>	<b><math>\delta^{18}\text{O}</math> (V-SMOW)</b>
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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