

Supplement to Estimates of carbonyl sulfide and methane stratospheric lifetimes based on AirCore profiles

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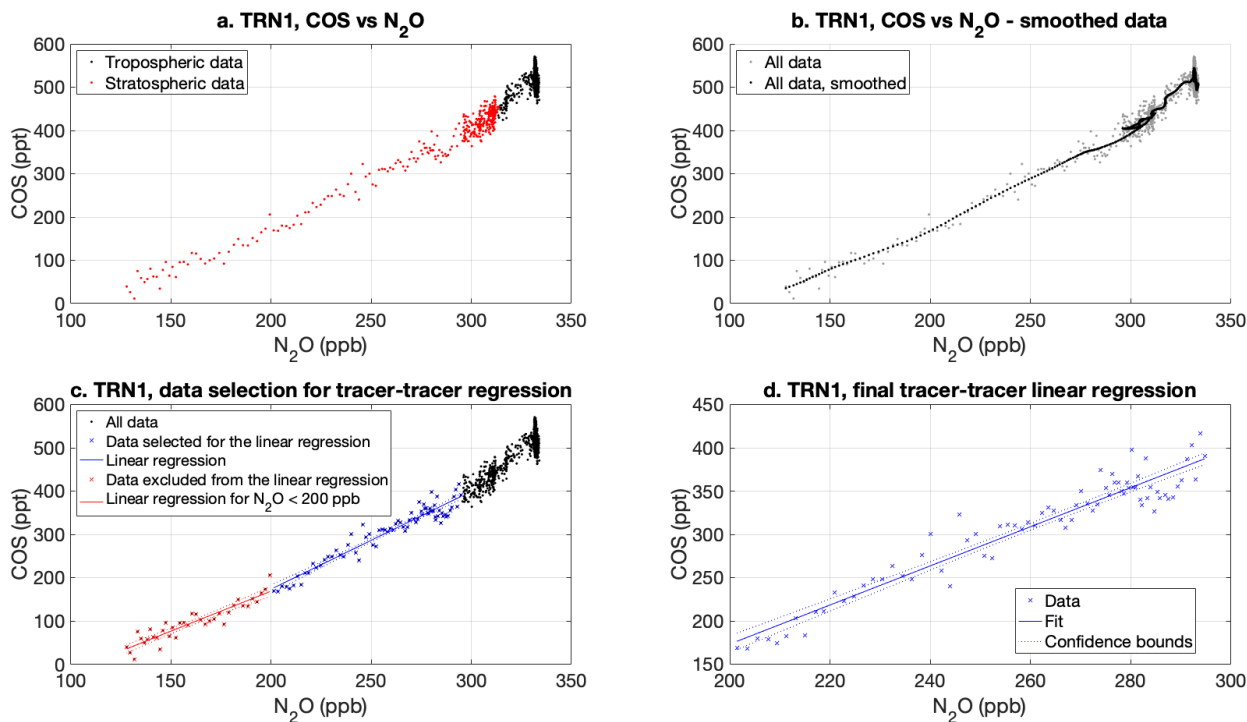
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S1 Data selection process for calculating the slope from COS-N₂O correlation

In this section, the data selection process for the COS-N₂O slope estimation will be presented for all flights except TRN2, which is reported in the main text.



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Figure S1: data selection steps for the linear regression between COS and N_2O , TRN1 AirCore data.

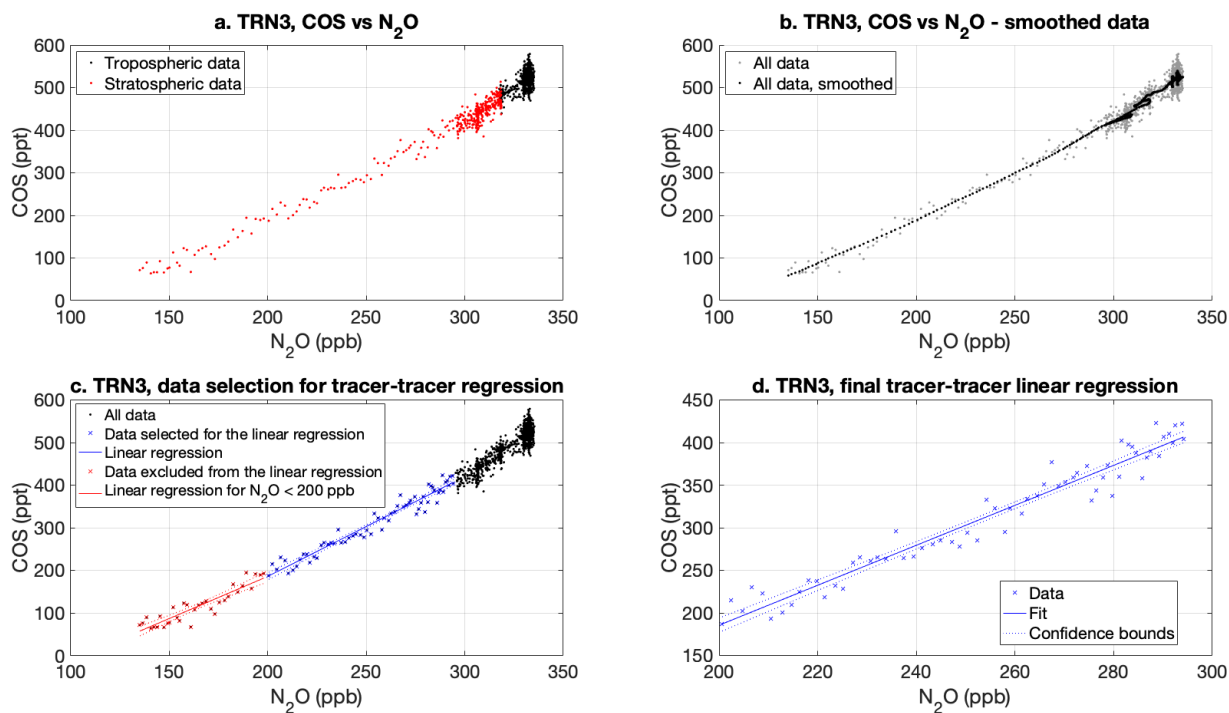
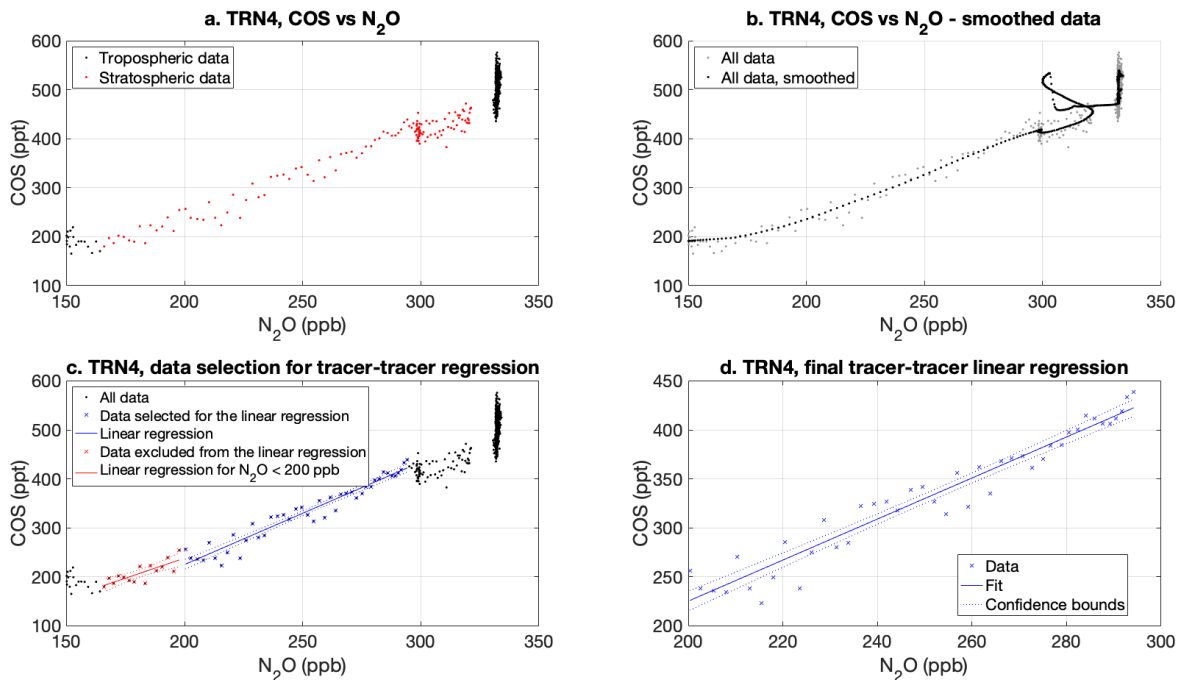


Figure S2: data selection steps for the linear regression between COS and N_2O , TRN3 AirCore data.



25 **Figure S3: data selection steps for the linear regression between COS and N₂O, TRN4 AirCore data.**

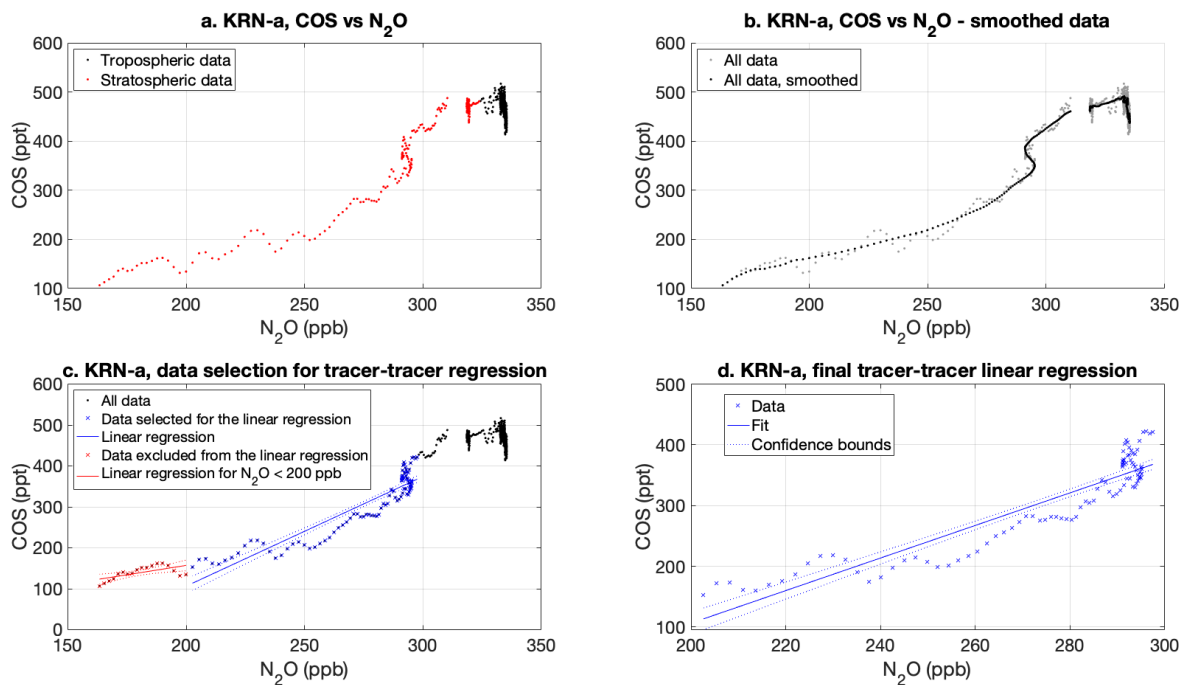


Figure S4: data selection steps for the linear regression between COS and N₂O, KRN-a AirCore data.

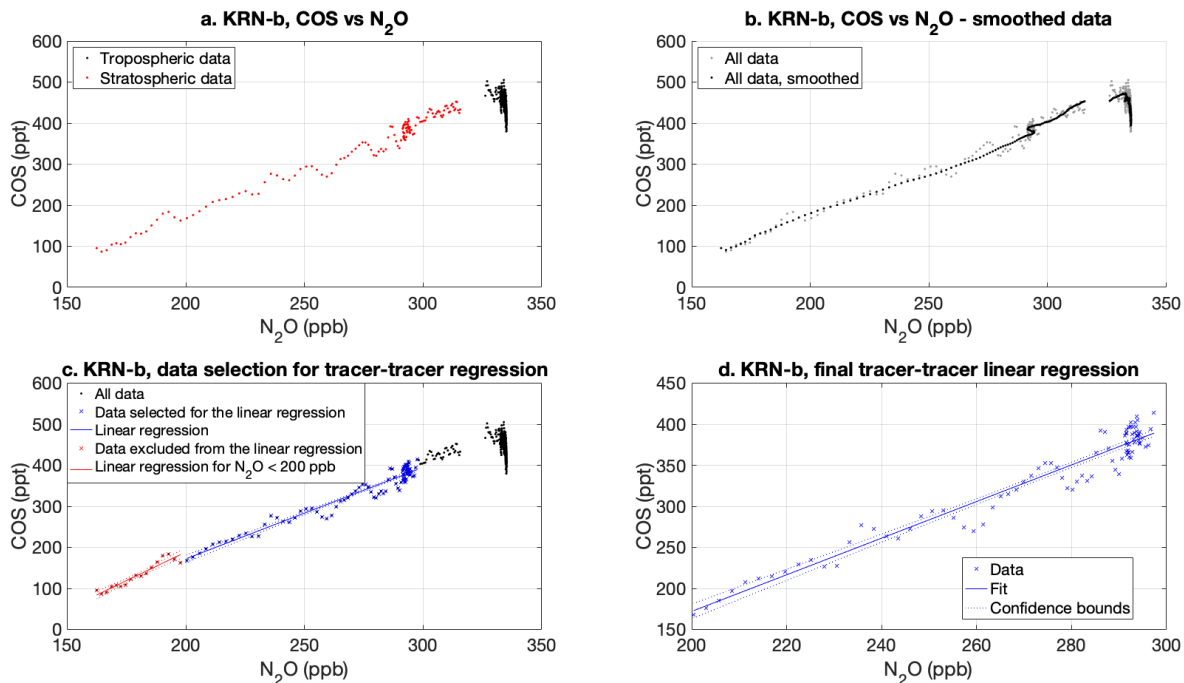


Figure S5: data selection steps for the linear regression between COS and N_2O , KRN-b AirCore data.

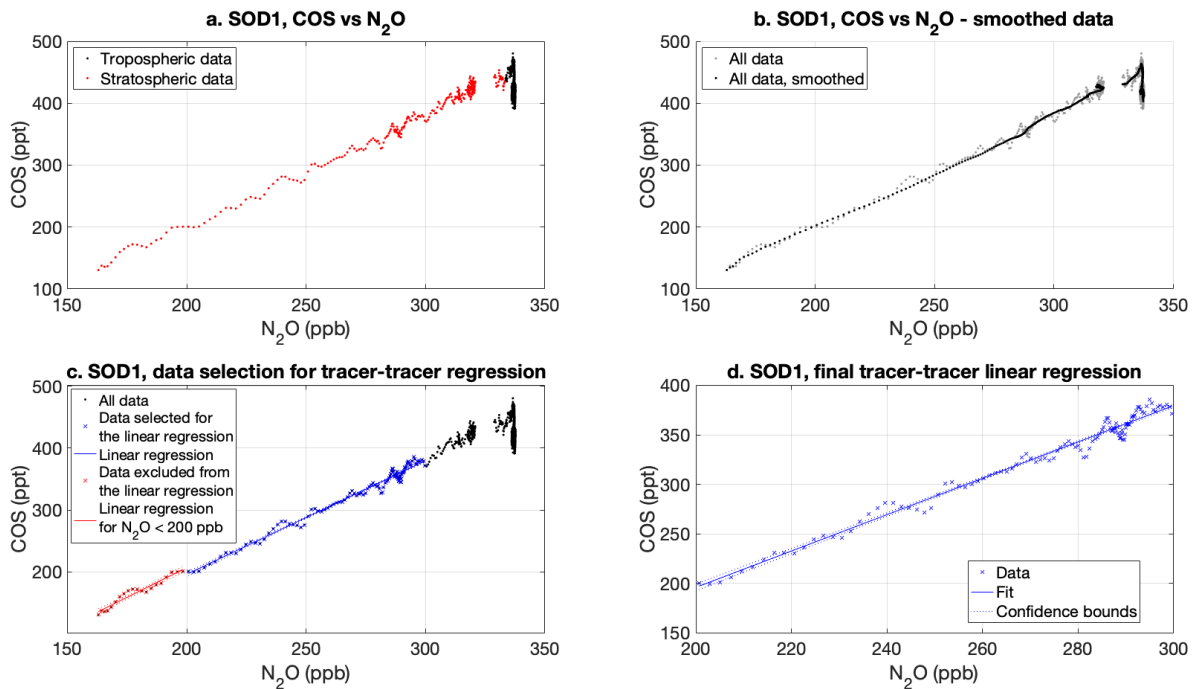


Figure S6: data selection steps for the linear regression between COS and N_2O , SOD1 AirCore data.

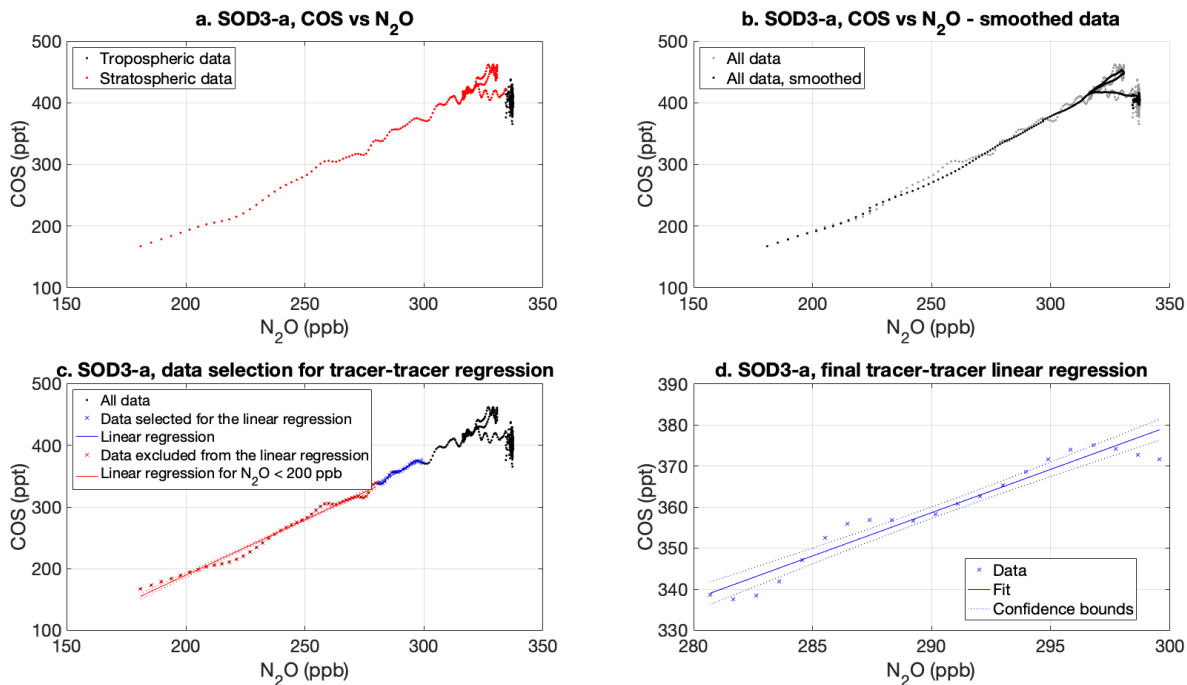
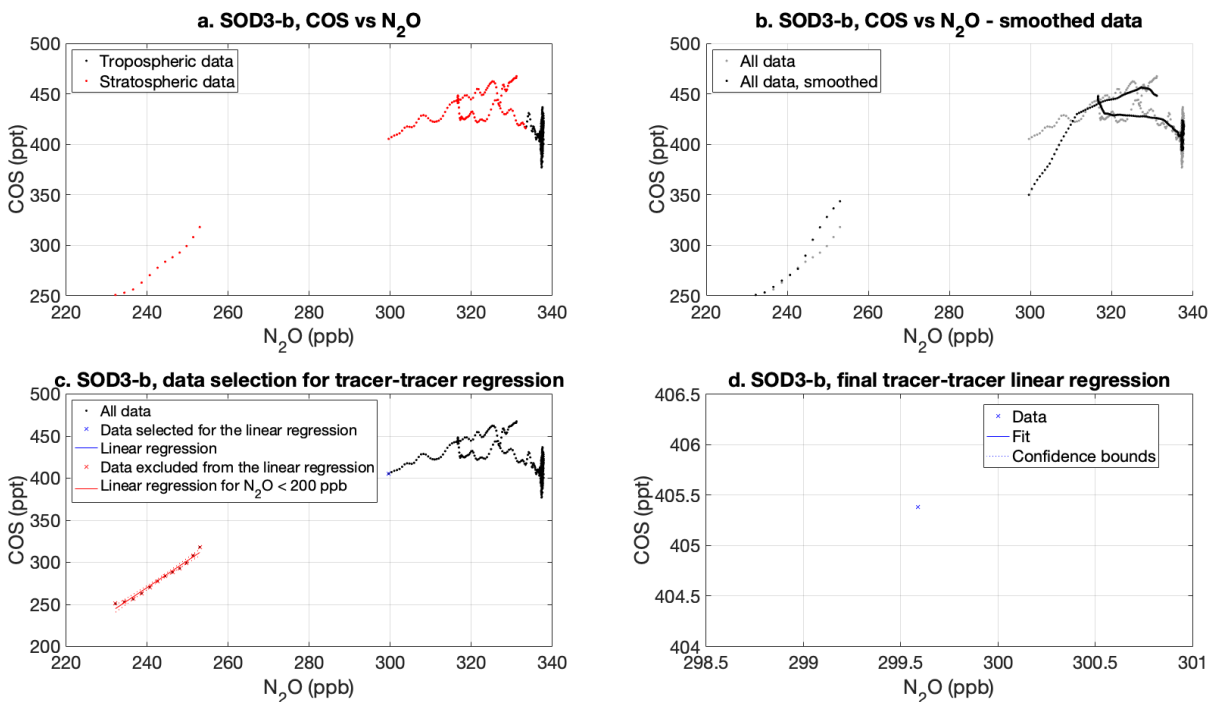


Figure S7: data selection steps for the linear regression between COS and N₂O, SOD3-a AirCore data.



35 Figure S8: data selection steps for the linear regression between COS and N₂O, SOD3-b AirCore data.

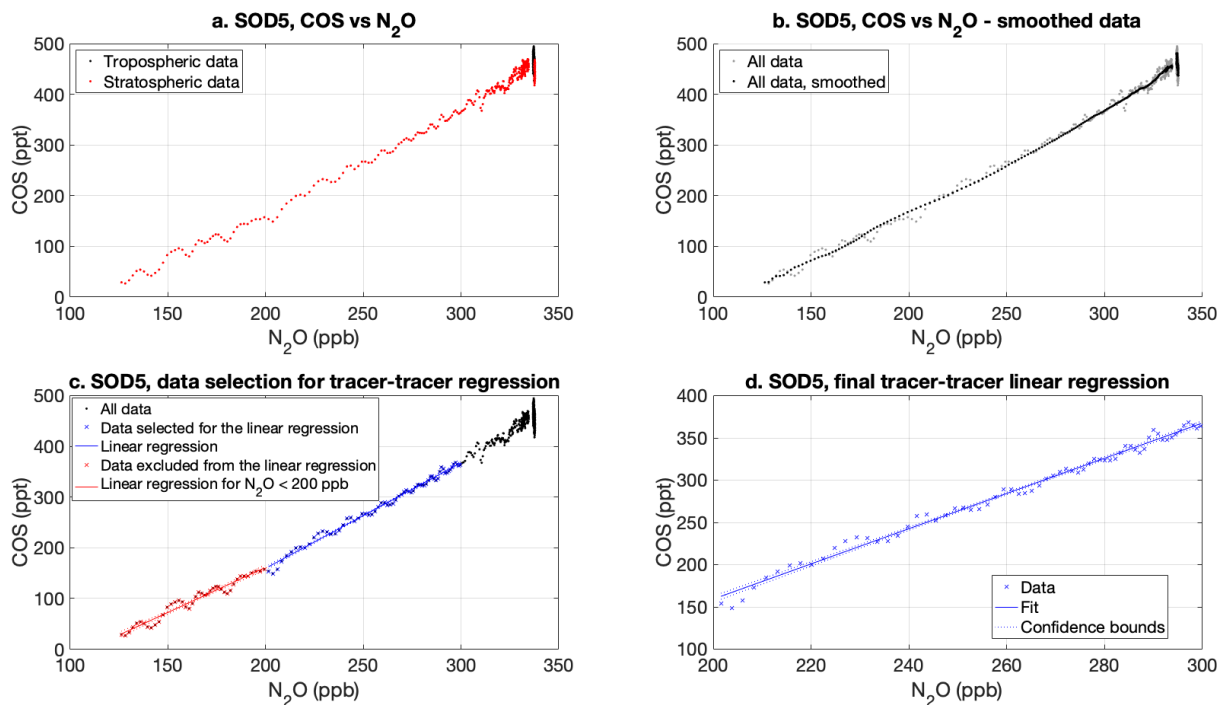


Figure S9: data selection steps for the linear regression between COS and N₂O, SOD5 AirCore data.

S2 Data selection process for calculating the slope from CH₄-N₂O correlation

In this section, the data selection process for the CH₄-N₂O slope estimation will be presented for all flights except TRN2, which is reported in the main text.

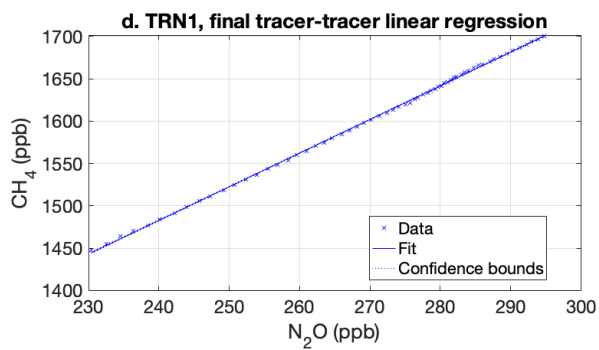
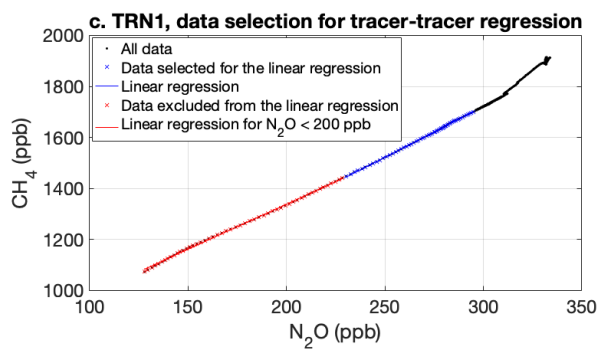
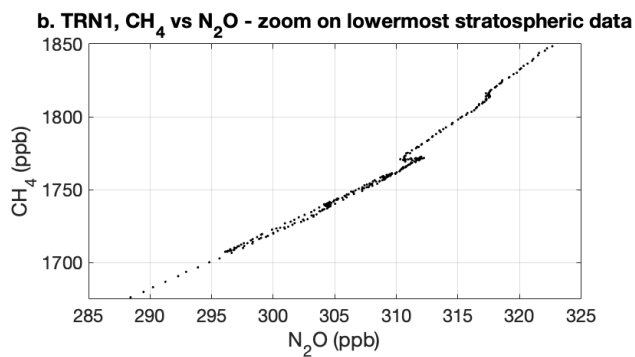
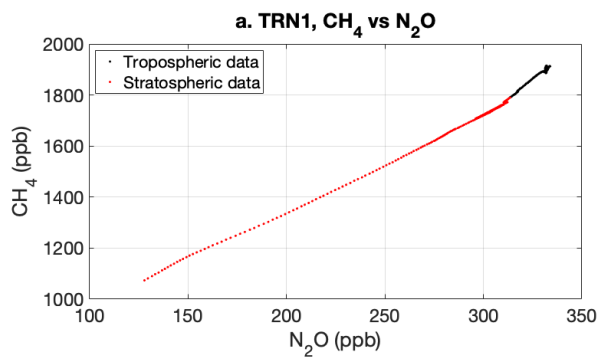
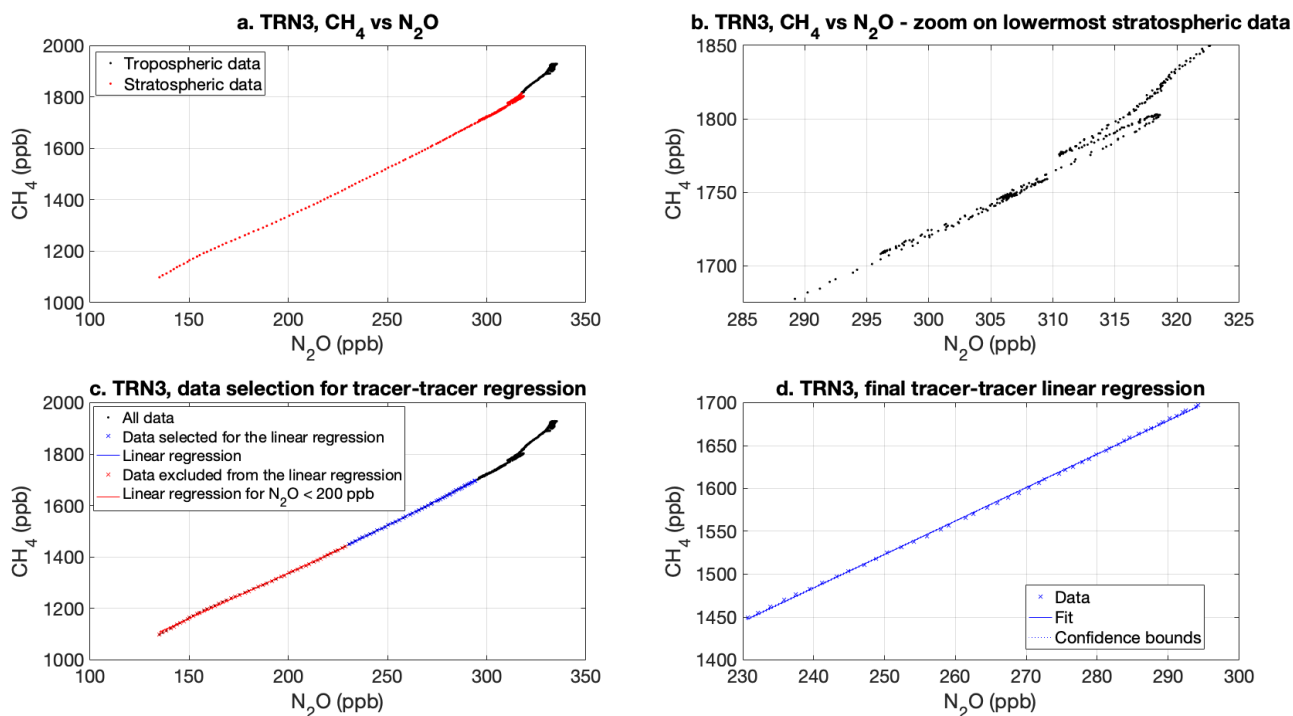


Figure S10: data selection steps for the linear regression between CH₄ and N₂O, TRN1 AirCore data.



45 **Figure S11: data selection steps for the linear regression between CH₄ and N₂O, TRN3 AirCore data.**

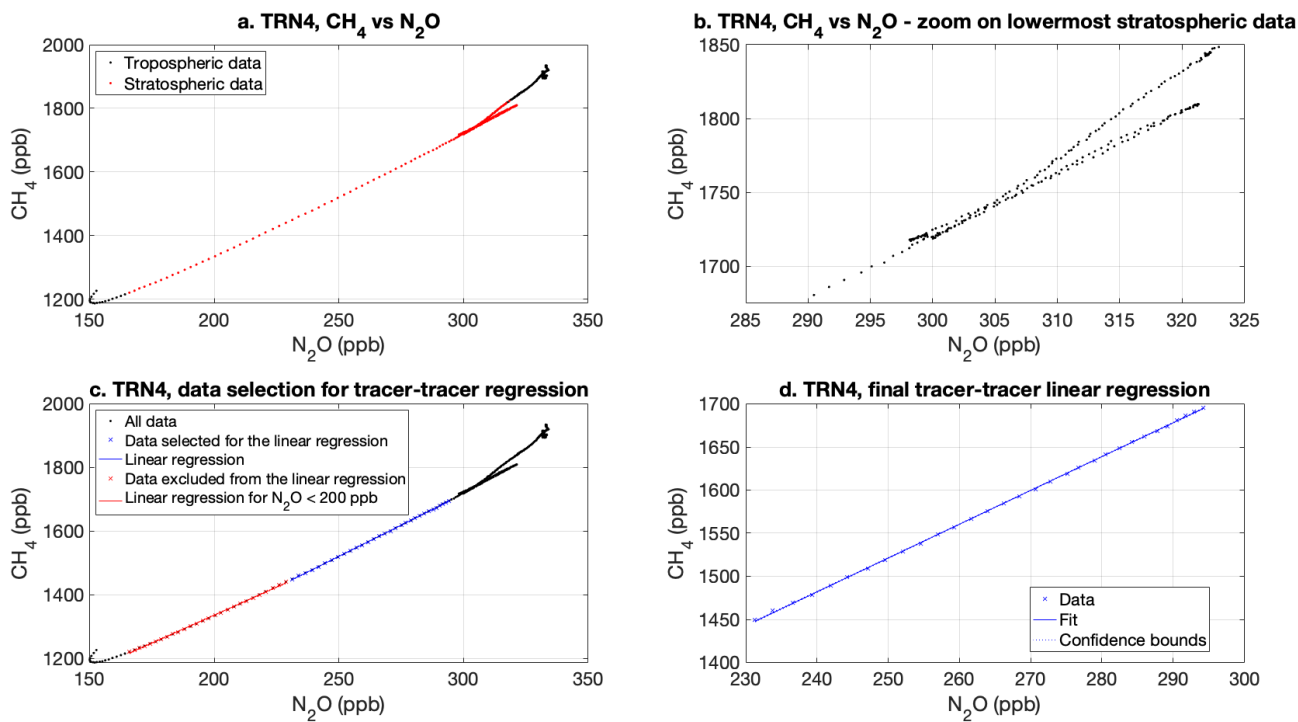


Figure S12: data selection steps for the linear regression between CH₄ and N₂O, TRN1 AirCore data.

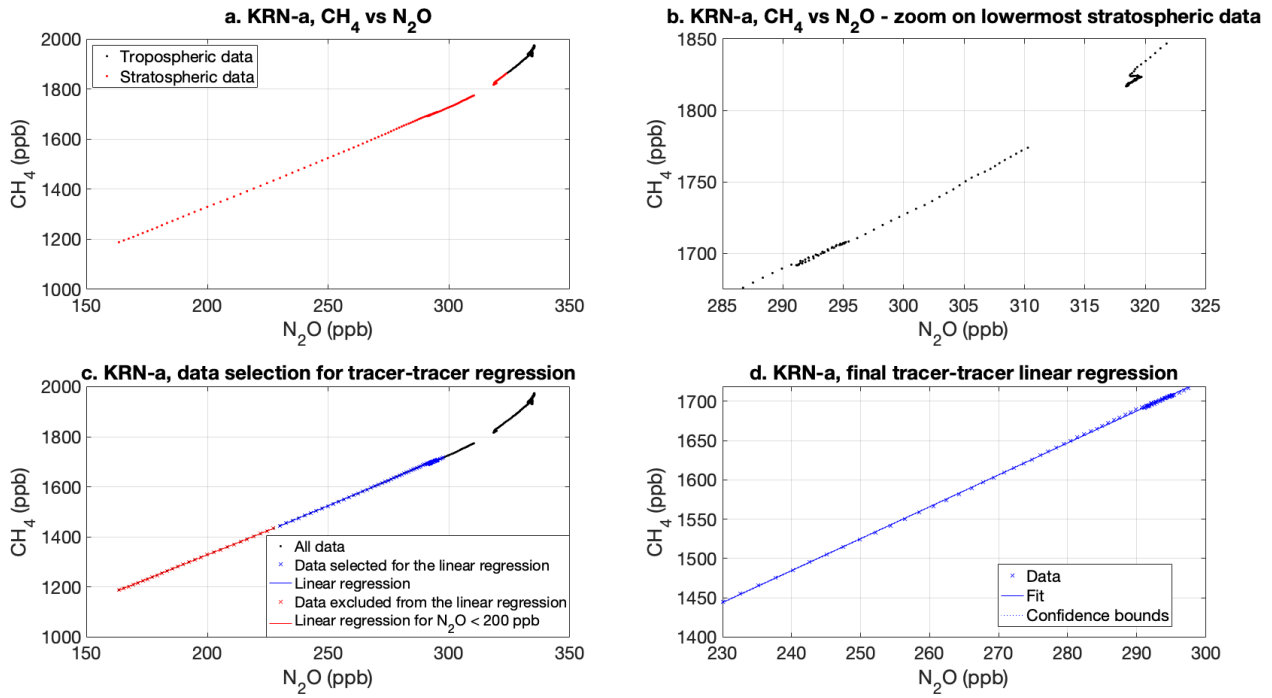


Figure S13: data selection steps for the linear regression between CH₄ and N₂O, KRN-a AirCore data.

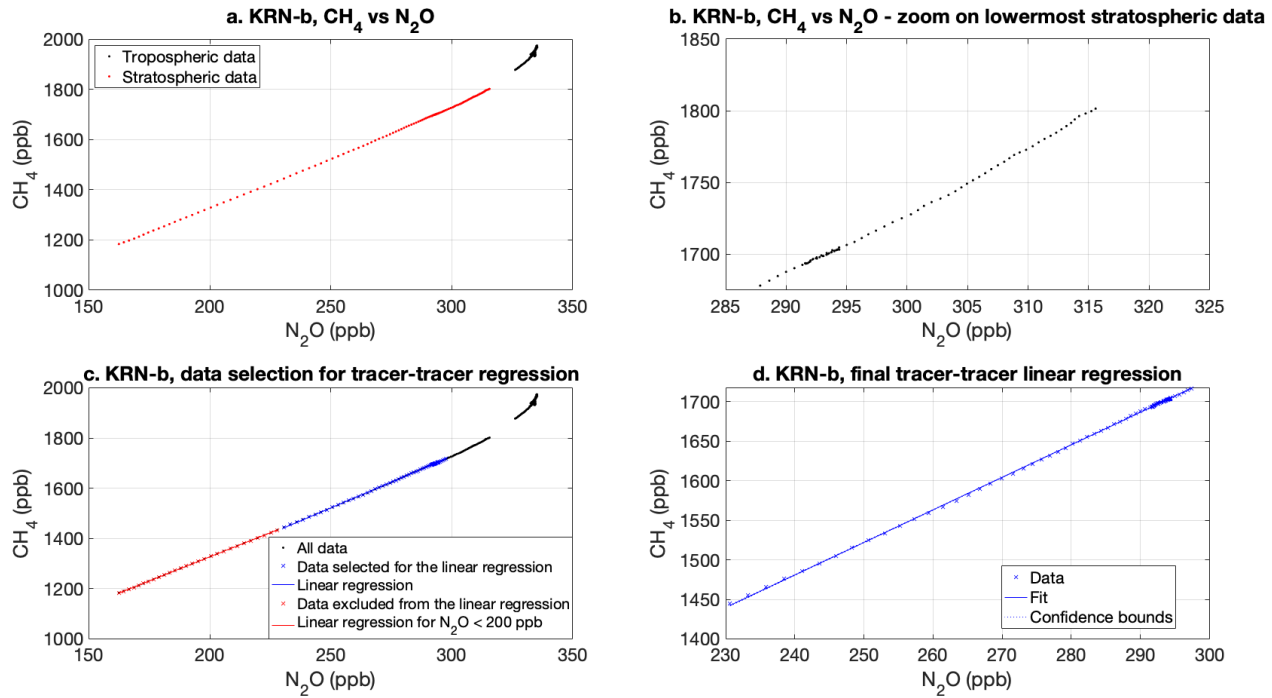


Figure S14: data selection steps for the linear regression between CH₄ and N₂O, KRN-b AirCore data.

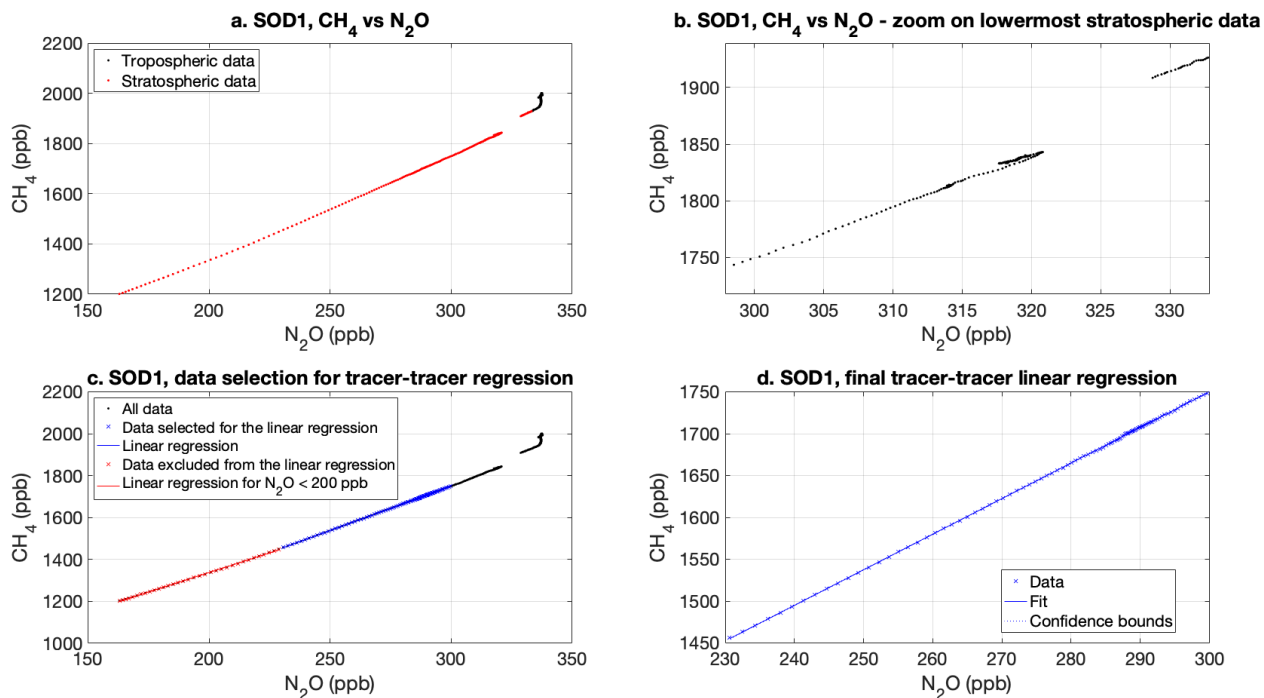
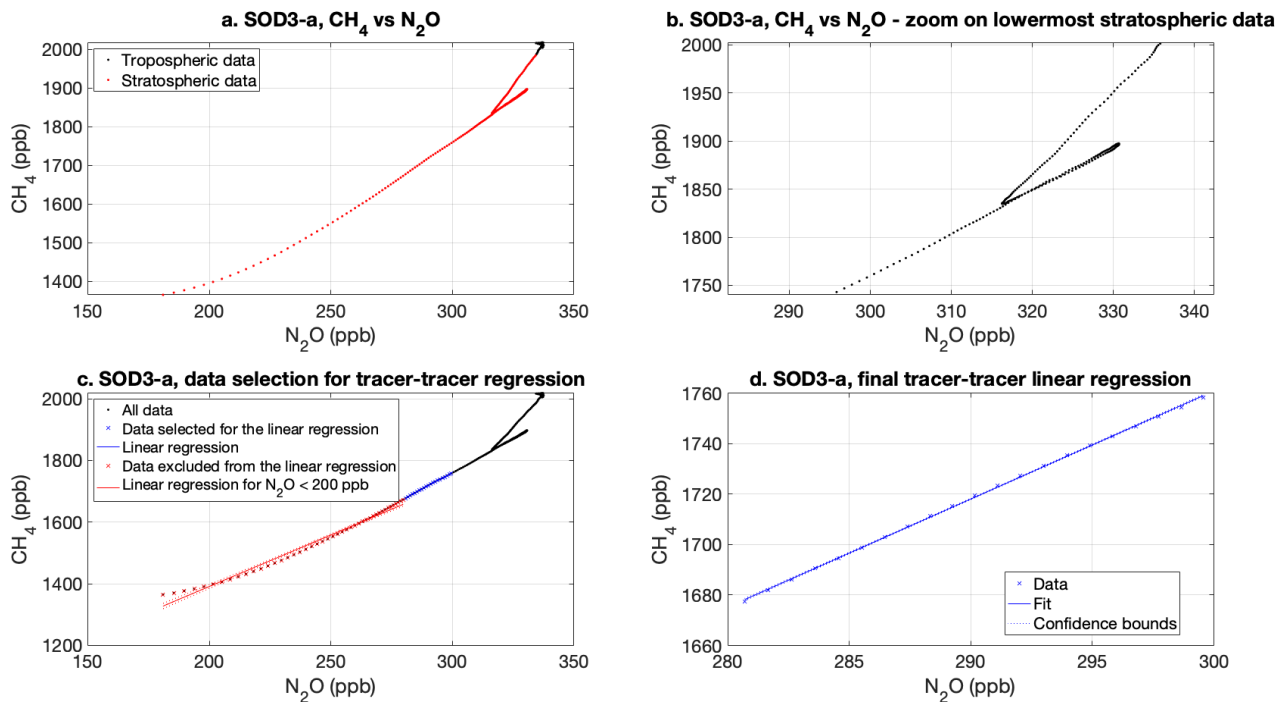


Figure S15: data selection steps for the linear regression between CH₄ and N₂O, SOD1 AirCore data.



55 Figure S16: data selection steps for the linear regression between CH₄ and N₂O, SOD3-a AirCore data.

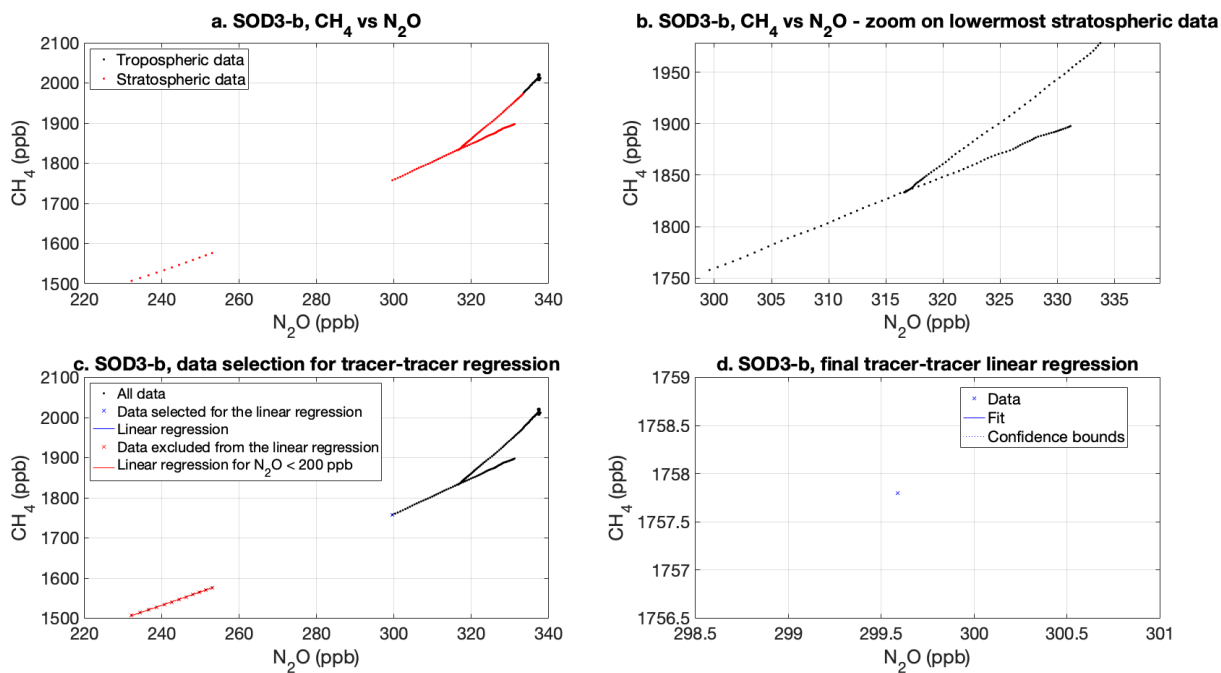
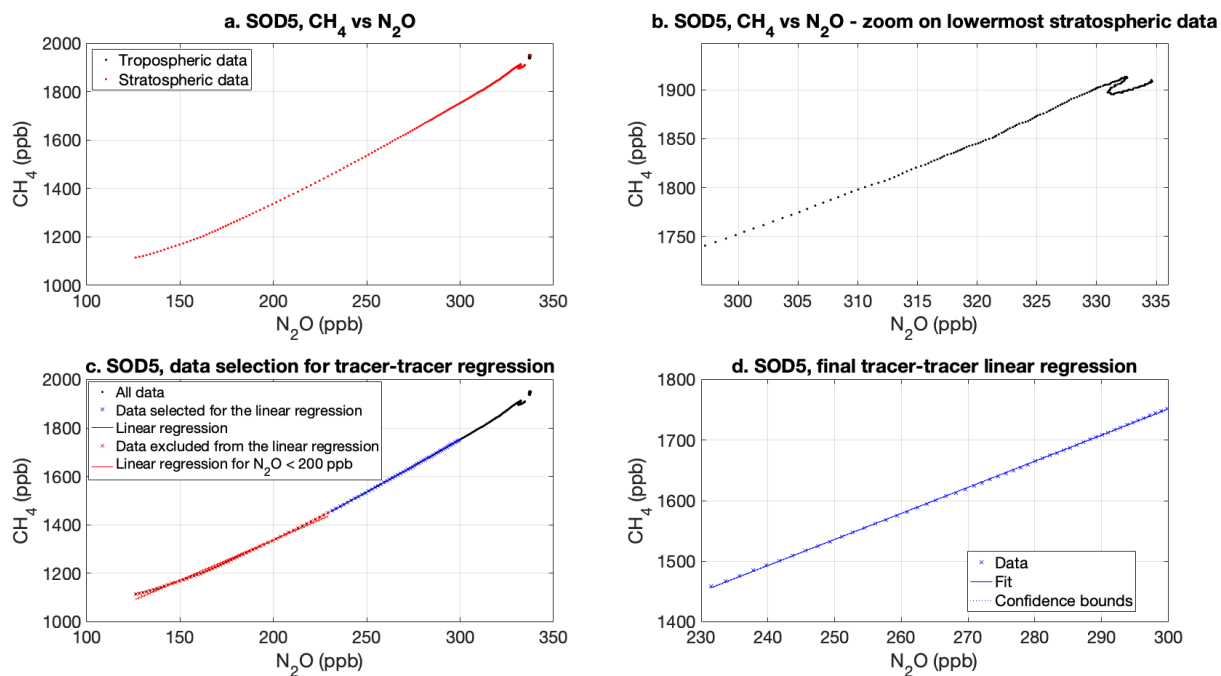


Figure S17: data selection steps for the linear regression between CH₄ and N₂O, SOD3-b AirCore data.



60 Figure S18: data selection steps for the linear regression between CH₄ and N₂O, SOD5 AirCore data.