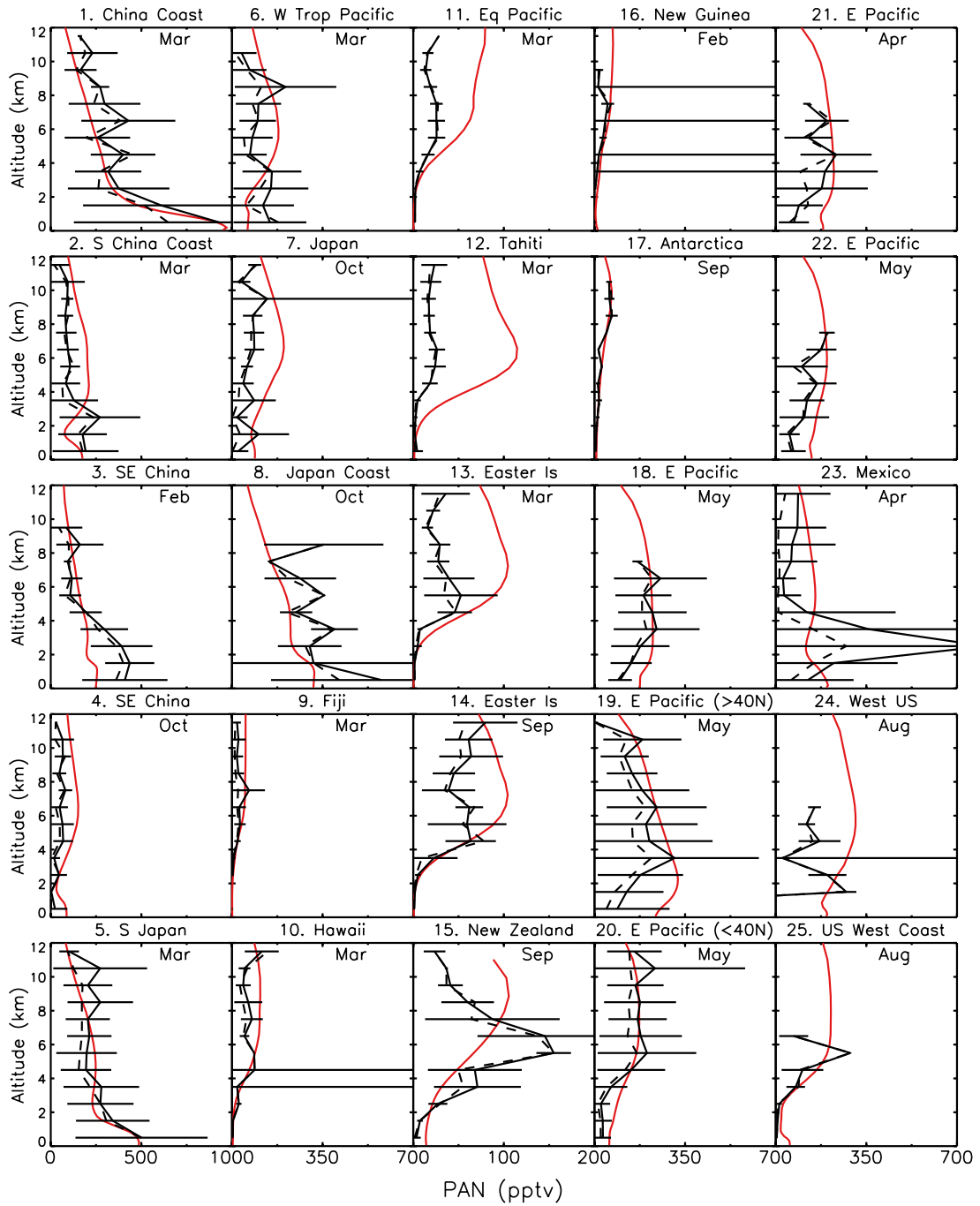
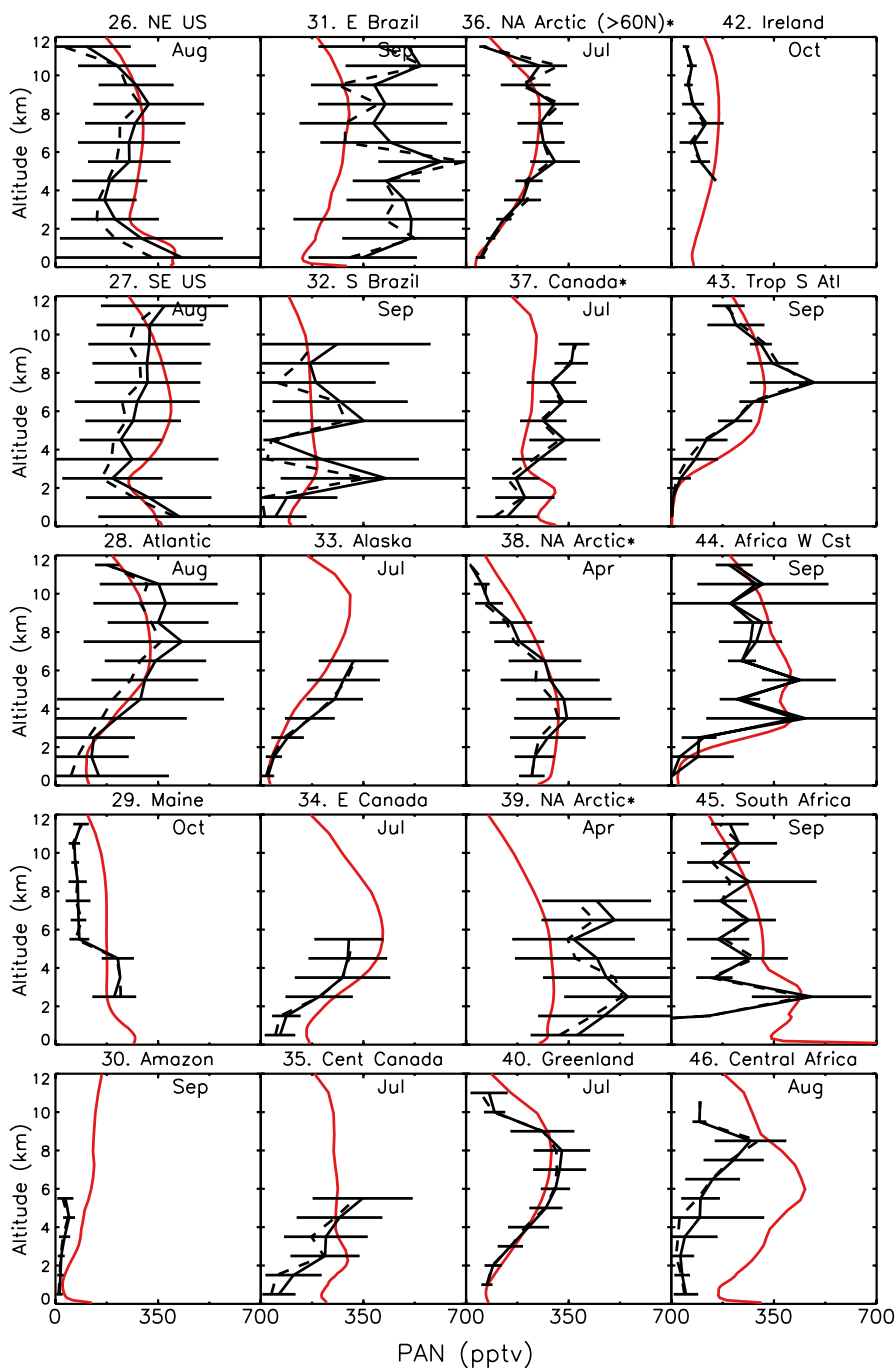


Supplementary Information

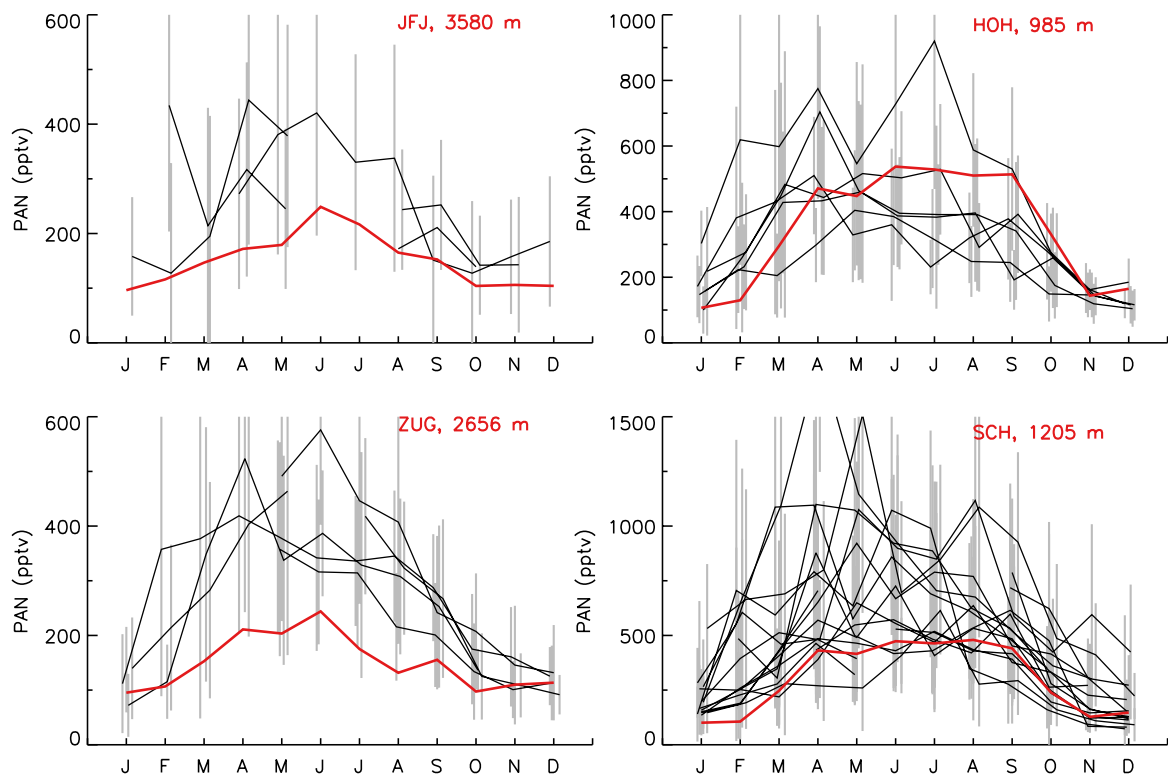
Title: Atmospheric Peroxyacetyl nitrate (PAN): a global budget and source attribution





**Figure S1:** Vertical profiles of PAN for the regions in Figure 1 and Table 1. Solid lines, dashed lines and horizontal bars are the mean, median and standard deviations of the aircraft observations. The model results (red lines) calculated using GEOS-5 for 2008, are monthly mean values for the flight regions. \* Indicates that the data has been filtered to remove biomass burning plumes. Different filters were applied for each dataset

following the analysis of Liang et al. (2011) and Brock et al. (2011). Biomass burning plumes were identified in ARCTAS-A as samples with  $\text{CH}_3\text{CN} > 145$  pptv and  $\text{CO} > 160$  ppbv, in ARCTAS-B as samples with  $\text{CH}_3\text{CN} > 320$  pptv and  $\text{CO} > 120$  ppbv, and in ARCPAC as samples with  $\text{CH}_3\text{CN} > 100$  pptv and  $\text{CO} > 170$  ppbv. Only marine data and model results west of  $125^\circ\text{W}$  have been included for INTEX-B and ITCT-2K2. Transit flights, where the San Francisco and Los Angeles plumes were encountered, were also removed from the ITCT-2K2 data. Note the differences in scales between panels.



**Figure S2:** PAN mixing ratios for European mountaintop sites: Jungfraujoch (JFJ), Zugspitze (ZUG), Hohenpeissenberg (HOH) and Schauinsland (SCH). Black lines are monthly mean observed values over many years (Table 1). Grey vertical bars are standard deviations for each monthly mean. The model results (red lines) are monthly mean values for 2008.