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Atmospheric distribution of HCN from satellite observations and 3-D model simulations

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1 Supplementary section

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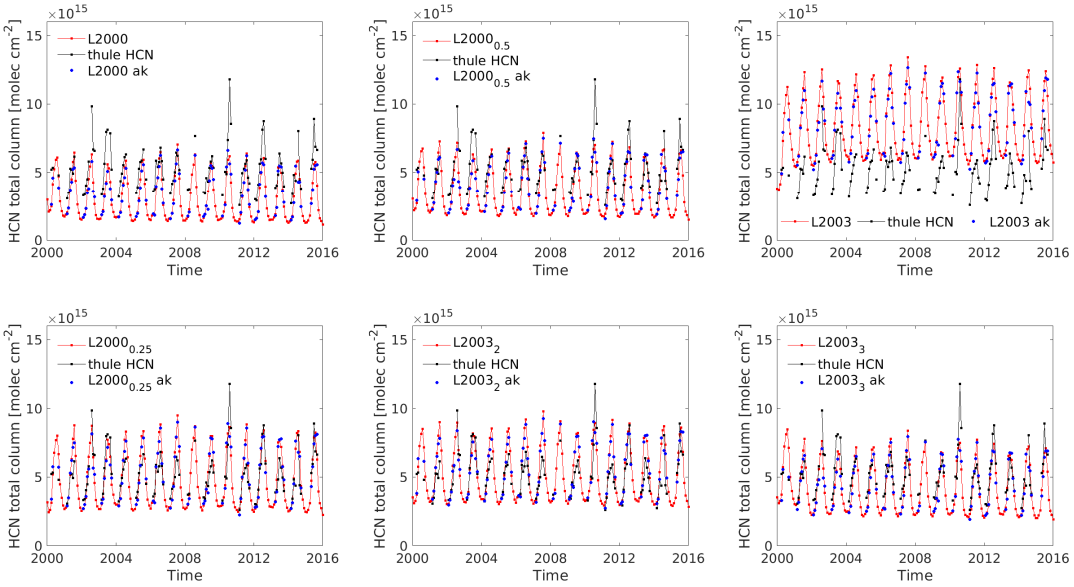

Figure S1. HCN total column time series (molecules cm^{-2}) measured at Thule (76.5° N, 68.7° W) NDACC station and modelled at the same location for 6 different model tracers (see main paper Table 3). Each panel shows the NDACC observations (black dots and line) and results from one model tracer without (red dots and line) or with (blue dots) the FTIR averaging kernels applied.

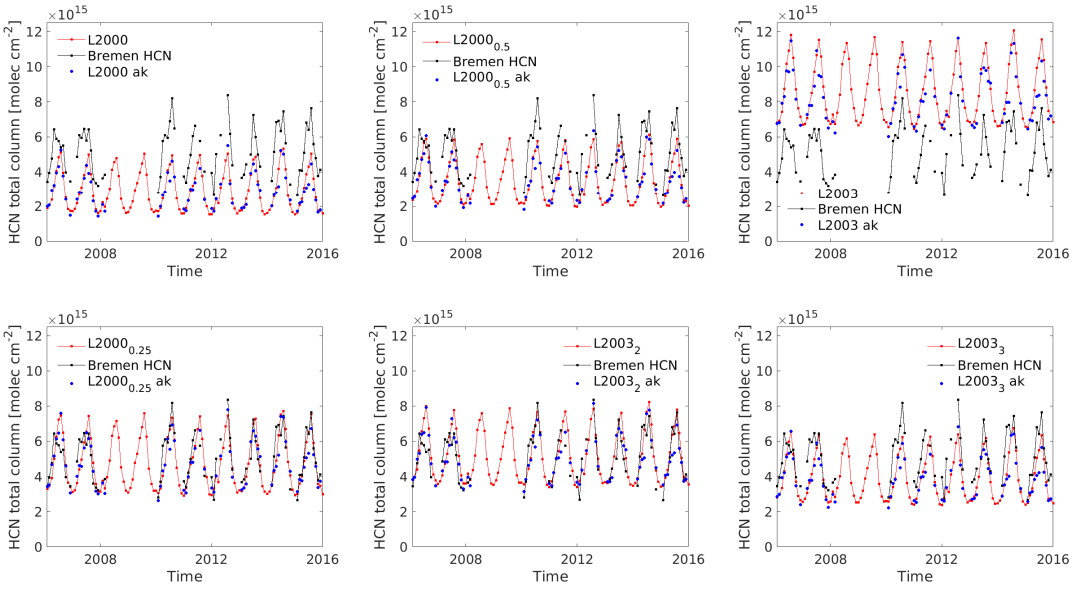

Figure S2. HCN total column time series (molecules cm^{-2}) measured at Bremen (53.1° N, 8.8° E) NDACC station and modelled at the same location for 6 different model tracers (see main paper Table 3). Each panel shows the NDACC observations (black dots and line) and results from one model tracer without (red dots and line) or with (blue dots) the FTIR averaging kernels applied.

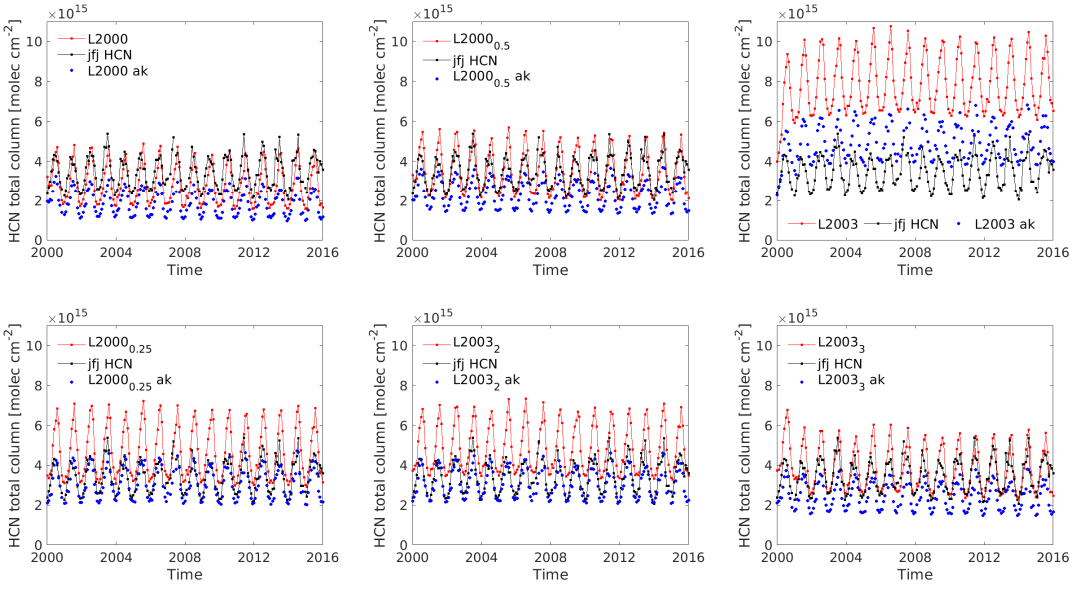

Figure S3. HCN total column time series (molecules cm^{-2}) measured at Jungfraujoch (46.6° N, 8.0° E) NDACC station and modelled at the same location for 6 different model tracers (see main paper Table 3). Each panel shows the NDACC observations (black dots and line) and results from one model tracer without (red dots and line) or with (blue dots) the FTIR averaging kernels applied.

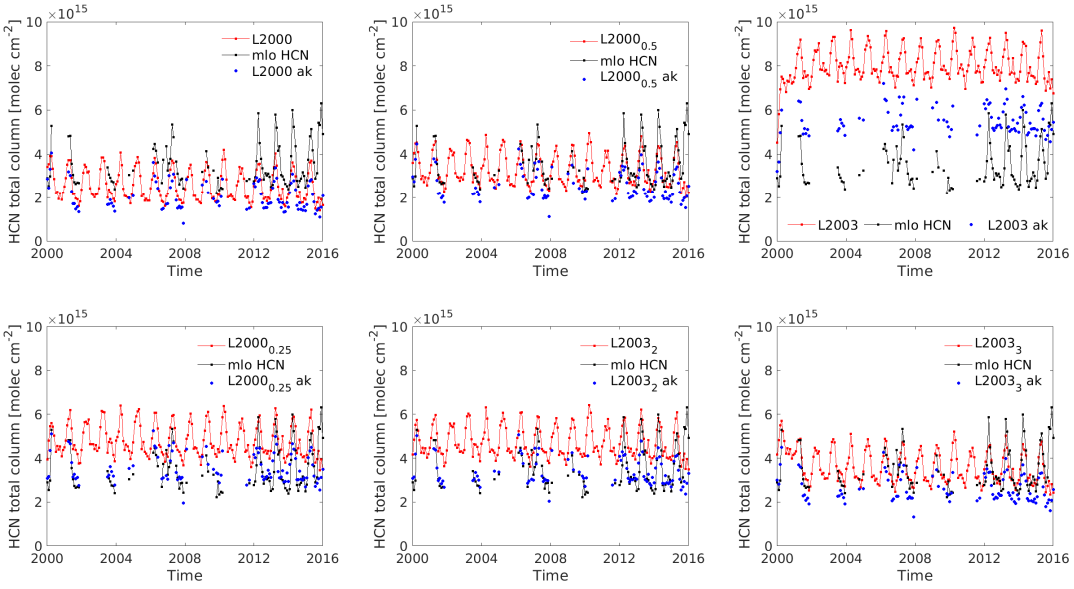

Figure S4. HCN total column time series (molecules cm^{-2}) measured at Mauna Loa (19.5° N, 155.6° W) NDACC station and modelled at the same location for 6 different model tracers (see main paper Table 3). Each panel shows the NDACC observations (black dots and line) and results from one model tracer without (red dots and line) or with (blue dots) the FTIR averaging kernels applied.

Table S1. Root Mean Square Error (RMSE) between the six TOMCAT model HCN tracers and FTIR measurements at four NDACC station locations.

	$RMSE_{Bremen}$ 10^{15} [molec/cm^2]	$RMSE_{Jungfraujoch}$ 10^{15} [molec/cm^2]	$RMSE_{MaunaLoa}$ 10^{15} [molec/cm^2]	$RMSE_{Thule}$ 10^{15} [molec/cm^2]
L2000	2.3121	1.6261	1.6443	1.9297
$L2000_{0.5}$	1.7074	1.2220	1.2377	1.4505
L2003	3.2794	1.5499	2.1820	3.8029
$L2000_{0.25}$	0.8505	0.5402	0.8130	1.2199
$L2003_2$	0.8291	0.5388	0.8303	1.2964
$L2003_3$	1.4041	1.1034	1.1910	1.2301

Table S2. Coefficient of determination (R^2) between the model HCN tracers at four NDACC station locations and FTIR measurements.

	R^2_{Bremen}	$R^2_{Jungfraujoch}$	$R^2_{MaunaLoa}$	R^2_{Thule}
L2000	-1.8189	-3.2000	-1.8349	-0.3984
$L2000_{0.5}$	-0.5373	-1.3717	-0.6064	0.2098
L2003	-4.6711	-2.8154	-3.9923	-4.4313
$L2000_{0.25}$	0.6186	0.5366	0.3069	0.4411
$L2003_2$	0.6375	0.5389	0.2772	0.3689
$L2003_3$	-0.0397	-0.9339	-0.4875	0.4317