

Supporting Information for

Possible effects of greenhouse gases to ozone profiles and DNA active UV-B irradiance at ground level

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HOHENPEISSENBERG

(a) 1-7 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.811	0.004	0.794	0.038	20.828	<0.0001	227
CTM3 and Lidar	0.580	-0.082	0.384	0.037	10.387	<0.0001	215
CTM3 and CCM	0.764	0.309	0.836	0.050	16.827	<0.0001	204
CCM and SBUV	0.667	-0.262	0.605	0.048	12.696	<0.0001	203
CCM and Lidar	0.583	-0.228	0.355	0.036	9.876	<0.0001	191
SBUV and Lidar	0.510	-0.072	0.354	0.041	8.641	<0.0001	214

(b) 7-30 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.836	0.001	0.775	0.034	22.865	<0.0001	227
CTM3 and Lidar	0.731	0.134	0.541	0.035	15.626	<0.0001	215
CTM3 and CCM	0.922	0.024	1.082	0.032	33.945	<0.0001	204
CCM and SBUV	0.851	-0.021	0.697	0.030	22.953	<0.0001	203
CCM and Lidar	0.762	0.021	0.497	0.031	16.157	<0.0001	191
SBUV and Lidar	0.691	0.029	0.574	0.041	13.906	<0.0001	214

(c) 30-100 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.773	-0.003	0.893	0.049	18.254	<0.0001	227
CTM3 and Lidar	0.579	0.163	0.454	0.044	10.364	<0.0001	215
CTM3 and CCM	0.716	-0.185	0.753	0.052	14.596	<0.0001	204
CCM and SBUV	0.644	0.095	0.717	0.060	11.945	<0.0001	203
CCM and Lidar	0.650	-0.210	0.507	0.043	11.746	<0.0001	191
SBUV and Lidar	0.552	0.152	0.375	0.039	9.631	<0.0001	214

* Error, t-value and p-value refer to slope.



Table S2. Statistics of correlations between ozone from Oslo CTM3, EMAC CCM (SC1SD-base-02), SBUV (v8.6) and Lidar data anomalies in **Haute Provence**, in the: (a) upper stratosphere (1-7 hPa), (b) middle stratosphere (7-30 hPa) and (c) lower stratosphere (30-100 hPa). Seasonal and other known natural variability has been removed from the data. For lidars the upper stratospheric layers are confined between 3 and 7 hPa.

HAUTE PROVENCE

(a) 1-7 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.832	0.003	0.820	0.036	22.491	<0.0001	227
CTM3 and Lidar	0.490	-0.072	0.370	0.046	8.062	<0.0001	208
CTM3 and CCM	0.786	0.328	0.852	0.047	18.046	<0.0001	204
CCM and SBUV	0.700	-0.305	0.647	0.047	13.907	<0.0001	203
CCM and Lidar	0.382	-0.193	0.259	0.046	5.572	<0.0001	184
SBUV and Lidar	0.364	-0.042	0.279	0.050	5.614	<0.0001	208

(b) 7-30 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.832	0.005	0.786	0.035	22.529	<0.0001	227
CTM3 and Lidar	0.759	0.127	0.612	0.036	16.766	<0.0001	209
CTM3 and CCM	0.927	-0.023	1.069	0.030	35.214	<0.0001	204
CCM and SBUV	0.845	0.018	0.722	0.032	22.357	<0.0001	203
CCM and Lidar	0.775	0.070	0.559	0.034	16.575	<0.0001	185
SBUV and Lidar	0.728	0.028	0.634	0.042	15.278	<0.0001	209

(c) 30-100 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.723	0.018	0.856	0.053	16.020	<0.0001	227
CTM3 and Lidar	0.618	0.187	0.519	0.046	11.318	<0.0001	209
CTM3 and CCM	0.737	-0.181	0.732	0.047	15.513	<0.0001	204
CCM and SBUV	0.683	0.180	0.820	0.062	13.240	<0.0001	203
CCM and Lidar	0.664	0.048	0.583	0.049	12.000	<0.0001	185
SBUV and Lidar	0.604	0.171	0.433	0.040	10.909	<0.0001	209

* Error, t-value and p-value refer to slope.



Table S3. Statistics of correlations between ozone from Oslo CTM3, EMAC CCM (SC1SD-base-02), SBUV (v8.6) and Lidar data anomalies in **Table Mountain**, in the: (a) upper stratosphere (1-7 hPa), (b) middle stratosphere (7-30 hPa) and (c) lower stratosphere (30-100 hPa). Seasonal and other known natural variability has been removed from the data. For lidars the upper stratospheric layers are confined between 3 and 7 hPa.

TABLE MOUNTAIN

(a) 1-7 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.812	-0.001	0.944	0.045	20.894	<0.0001	227
CTM3 and Lidar	0.255	-0.475	0.132	0.041	3.240	0.00147	153
CTM3 and CCM	0.715	0.197	0.729	0.050	14.533	<0.0001	204
CCM and SBUV	0.670	-0.205	0.762	0.059	12.806	<0.0001	203
CCM and Lidar	0.242	-0.669	0.112	0.039	2.852	0.00505	133
SBUV and Lidar	0.184	-0.498	0.084	0.037	2.288	0.02352	152

(b) 7-30 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.761	-0.001	0.672	0.038	17.582	<0.0001	227
CTM3 and Lidar	0.455	0.026	0.290	0.052	5.570	<0.0001	121
CTM3 and CCM	0.854	0.015	0.883	0.038	23.371	<0.0001	204
CCM and SBUV	0.699	-0.005	0.628	0.045	13.868	<0.0001	203
CCM and Lidar	0.511	-0.203	0.359	0.061	5.913	<0.0001	101
SBUV and Lidar	0.454	-0.167	0.353	0.064	5.540	<0.0001	120

(c) 30-100 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.752	-0.0004	0.990	0.058	17.123	<0.0001	227
CTM3 and Lidar	0.476	0.076	0.358	0.064	5.550	<0.0001	107
CTM3 and CCM	0.781	-0.354	0.826	0.046	17.790	<0.0001	204
CCM and SBUV	0.723	0.086	0.932	0.063	14.835	<0.0001	203
CCM and Lidar	0.519	-0.295	0.423	0.075	5.660	<0.0001	89
SBUV and Lidar	0.569	-0.152	0.337	0.048	7.048	<0.0001	106

* Error, t-value and p-value refer to slope.



Table S4. Statistics of correlations between ozone from Oslo CTM3, EMAC CCM (SC1SD-base-02), SBUV (v8.6) and Lidar data anomalies in **Mauna Loa**, in the: (a) upper stratosphere (1-7 hPa), (b) middle stratosphere (7-30 hPa) and (c) lower stratosphere (30-100 hPa). Seasonal and other known natural variability has been removed from the data. For lidars the upper stratospheric layers are confined between 3 and 7 hPa.

MAUNA LOA

(a) 1-7 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.687	0.005	0.715	0.050	14.171	<0.0001	227
CTM3 and Lidar	0.509	0.011	0.348	0.040	8.635	<0.0001	215
CTM3 and CCM	0.720	0.265	0.690	0.047	14.757	<0.0001	204
CCM and SBUV	0.648	-0.335	0.723	0.060	12.070	<0.0001	203
CCM and Lidar	0.384	-0.294	0.259	0.045	5.721	<0.0001	191
SBUV and Lidar	0.363	-0.032	0.238	0.042	5.667	<0.0001	214

(b) 7-30 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.765	-0.001	0.692	0.039	17.833	<0.0001	227
CTM3 and Lidar	0.848	0.012	0.715	0.031	23.342	<0.0001	214
CTM3 and CCM	0.750	0.040	0.845	0.052	16.092	<0.0001	204
CCM and SBUV	0.731	0.103	0.596	0.039	15.2013	<0.0001	203
CCM and Lidar	0.783	-0.033	0.564	0.033	17.334	<0.0001	191
SBUV and Lidar	0.820	-0.011	0.761	0.037	20.791	<0.0001	213

(c) 30-100 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.632	0.028	1.136	0.093	12.223	<0.0001	227
CTM3 and Lidar	0.639	0.294	0.766	0.055	13.877	<0.0001	210
CTM3 and CCM	0.653	-0.302	0.727	0.059	12.260	<0.0001	204
CCM and SBUV	0.727	0.141	1.166	0.078	15.026	<0.0001	203
CCM and Lidar	0.778	0.471	0.796	0.047	17.047	<0.0001	191
SBUV and Lidar	0.748	0.020	0.467	0.029	16.194	<0.0001	209

* Error, t-value and p-value refer to slope.



Table S5. Statistics of correlations between ozone from Oslo CTM3, EMAC CCM (SC1SD-base-02), SBUV (v8.6) and Lidar data anomalies in **Lauder**, in the: (a) upper stratosphere (1-7 hPa), (b) middle stratosphere (7-30 hPa) and (c) lower stratosphere (30-100 hPa). Seasonal and other known natural variability has been removed from the data. For lidars the upper stratospheric layers are confined between 3 and 7 hPa.

LAUDER

(a) 1-7 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.749	-0.001	0.854	0.050	16.966	<0.0001	227
CTM3 and Lidar	0.487	0.064	0.365	0.051	7.141	<0.0001	166
CTM3 and CCM	0.669	0.095	0.744	0.058	12.809	<0.0001	204
CCM and SBUV	0.461	-0.131	0.480	0.065	7.364	<0.0001	203
CCM and Lidar	0.435	-0.242	0.309	0.053	5.854	<0.0001	149
SBUV and Lidar	0.422	-0.061	0.276	0.047	5.938	<0.0001	165

(b) 7-30 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.821	-0.0005	0.731	0.034	21.542	<0.0001	227
CTM3 and Lidar	0.705	0.125	0.501	0.039	12.702	<0.0001	165
CTM3 and CCM	0.875	0.026	0.952	0.037	25.674	<0.0001	204
CCM and SBUV	0.801	-0.031	0.706	0.036	19.352	<0.0001	203
CCM and Lidar	0.656	-0.156	0.462	0.044	10.501	<0.0001	148
SBUV and Lidar	0.634	0.030	0.474	0.045	10.448	<0.0001	164

(c) 30-100 hPa	Correlation coefficient	Intercept (%)	Slope	Error*	t-value	p-value	N
CTM3 and SBUV	0.654	-0.004	0.740	0.057	12.962	<0.0001	227
CTM3 and Lidar	0.578	0.109	0.490	0.054	9.035	<0.0001	165
CTM3 and CCM	0.731	0.288	0.851	0.056	15.247	<0.0001	204
CCM and SBUV	0.697	-0.192	0.687	0.050	13.784	<0.0001	203
CCM and Lidar	0.514	-0.013	0.352	0.050	7.236	<0.0001	148
SBUV and Lidar	0.558	0.015	0.399	0.047	8.568	<0.0001	164

* Error, t-value and p-value refer to slope.