

OZONE ANALYZER INTERCOMPARISON
 Thermo 49iPS_ACTRIS CM21267121

intercomparison place : Monte Cimone
 intercomparison operator: Paolo Cristofanelli, Francescopiero Calzolari
 Transfer Standard: Thermo 49iPs s/n: 1404860524
 Transfer Standard has been evaluated by ENPA on 1900-01-01 with SRP#15 giving
 slope of 1.000 and intercept of -0.3
 TS has been warmed-up for more then 12 hours and OA has been conditioning at
 200ppb for more then 2 hour
 OA has been evaluated at the following 9 concentration levels: 0, 15, 25, 50,
 75, 80, 100, 125 e 150 ppb

OA and TS condition:
 OA CM21267121 BKG=0.0 ; Coeff=1.017
 TS 1404860524 BKG=-0.3 ; Coeff=1.000
 intercomparison start : 2023-11-28 15:06:00 ; intercomparison end : 2023-11-29
 05:21:00
 LinregressResult(slope=0.9652019181149721, intercept=0.20574297464926872,
 rvalue=0.999998319172703, pvalue=2.351813722135837e-108,
 stderr=0.00028337593385874613, intercept_stderr=0.024741294866712477)

Linear regression results OAm_{mean} = TS_{mean}*slope + intercept:
 TS Transfer Standard
 OA O3 Analyzer

slope = 0.965202 slope_stderr = 2.834e-04
 intercept = 0.205743 intercept_stderr = 2.474e-02
 rsquare = 0.999997 covariance = 5.012e-22

TS_{mean}: TS average [O3] for each calibration step
 OA_{mean}: OA average [O3] for each calibration step
 Predicted = OA_{mean}*slope + intercept
 TS_{std}: TS standard deviation [O3] for each calibration step
 OA_{std}: OA standard deviation [O3] for each calibration step
 Residual = TS - predicted
 Deviation = OA - TS

TS _{mean}	TS _{std}	OA _{mean}	OA _{std}	predicted	residual	deviation
0.099	0.092	-0.185	0.124	0.027	0.072	-0.285
74.752	0.099	77.176	0.215	74.696	0.056	2.424
149.708	0.056	154.958	0.148	149.772	-0.063	5.250
124.727	0.111	129.027	0.180	124.743	-0.016	4.300
24.729	0.117	25.311	0.247	24.636	0.093	0.582
99.698	0.059	103.151	0.303	99.767	-0.069	3.453
79.678	0.058	82.196	0.159	79.542	0.136	2.518
49.710	0.052	51.127	0.136	49.554	0.156	1.417
14.706	0.155	14.957	0.124	14.643	0.064	0.251
99.685	0.103	103.214	0.230	99.828	-0.143	3.529
149.727	0.038	154.888	0.134	149.704	0.023	5.161
0.069	0.104	-0.158	0.178	0.054	0.015	-0.227
49.730	0.075	51.113	0.138	49.540	0.189	1.383
24.722	0.085	25.308	0.154	24.633	0.089	0.586
99.712	0.116	103.122	0.242	99.739	-0.027	3.410
124.730	0.080	129.020	0.178	124.737	-0.007	4.290
14.934	0.525	15.345	0.584	15.017	-0.083	0.411
74.663	0.089	77.167	0.236	74.687	-0.024	2.503
99.688	0.097	103.099	0.245	99.717	-0.028	3.410
79.711	0.093	82.357	0.135	79.697	0.014	2.646
0.089	0.214	0.007	0.151	0.213	-0.124	-0.082
74.693	0.090	77.354	0.160	74.868	-0.175	2.661
149.712	0.086	154.829	0.168	149.647	0.066	5.116
124.702	0.083	128.947	0.246	124.666	0.036	4.245
25.089	1.173	25.884	1.076	25.189	-0.100	0.795

99.714	0.075	103.195	0.147	99.810	-0.096	3.481
79.705	0.094	82.417	0.191	79.755	-0.050	2.712
49.707	0.049	51.298	0.147	49.719	-0.012	1.592
14.699	0.118	14.954	0.166	14.640	0.059	0.255
99.672	0.059	102.938	0.177	99.561	0.111	3.265
149.725	0.132	155.008	0.193	149.820	-0.095	5.283
0.058	0.118	-0.093	0.137	0.116	-0.058	-0.151
49.700	0.102	51.225	0.253	49.648	0.052	1.525
24.688	0.135	25.375	0.143	24.698	-0.010	0.688
99.715	0.098	102.980	0.158	99.602	0.113	3.265
124.730	0.073	129.016	0.237	124.732	-0.002	4.286
14.677	0.124	15.173	0.131	14.851	-0.174	0.496
74.701	0.111	77.115	0.186	74.638	0.063	2.414
99.685	0.116	103.010	0.246	99.631	0.054	3.325
79.693	0.158	82.393	0.214	79.732	-0.039	2.700
0.039	0.102	-0.103	0.136	0.107	-0.067	-0.142

Unoise: 0Astd average	= 0.214
Ulinearity: Residual standard deviation	= 0.088
Urepeat = sqrt(Unoise^2 + Ulinearity^2)	= 0.231
Udrift = sqrt(0.58^2+(0.0025*C)^2)	= 0.632
U = sqrt(Urepeat^2+Udrift^2)	= 0.672
C	= 100.0

compensation equation to obtain unbiased concentration
 $[O3unbiased] = ([OA] * 0.965) + 0.206$

Intercomparison 49iPS_ACTRIS s/n CM21267121 date : 20231129

