

Calibration Report

Brewer #157; Izaña, Spain; October 2-6, 2000

Instrument Status:

Brewer #157, a Mark III instrument was working well and been quite stable in past year. The instrument's constants were values from 1999 of ETC's 1565/210 and absn. coefficients .342/1.15. Set at these values, the ozone readings initially were about 1% lower than #017 (see graph and daily mean of first day). However analysis of the sun scan results showed that the wavelength cal step should be adjusted to 288 from 285. Later with a new mercury lamp, more sun scans showed the cal step setting should be 285 again. Standard Lamp ratios R6/R5 have been stable at 325/580 for the past year.

Ozone Test Results:

This inter-comparison resulted in approximately two hundred near simultaneous Direct Sun measurements of #157 with #017. The sun scan results showed (reference graph on next page) that the cal step should be 288 initially but changed back to 285 after a new Hg lamp was installed. The dispersion test results at step 285 produced an absorption coefficient of 0.342/1.15.

Ozone daily mean results -	day	O ₃	dev	SO ₂	dev	# / tot	mu	hr	ETC
Brewer #157 – icf24999	27600	270.2	+2.6	-0.2	+0.3	67/ 76	156	14	1534
ETC's 1565/210, absn. .342/1.15,	27700	267.9	+1.3	-0.1	+0.3	75/ 89	166	13	1579
	27800	263.7	+1.9	-0.3	+0.4	77/ 86	162	13	1553
	27900	267.6	+1.1	-0.1	+0.3	50/ 55	167	13	1565
#017 using ETC's 3220/3050	27600	274.4	+1.9	0.3	+0.4	59/ 78	151	15	3232
	27700	268.4	+1.7	0.1	+0.3	79/ 96	177	13	3247
	27800	263.9	+2.0	0.3	+0.4	94/117	173	13	3223
	27900	268.2	+1.6	0.4	+0.4	95/104	168	13	3232

UV calibration results:

The dispersion test was completed (dcf27900.157) and results compared well to constants in use (dcf28898.157) and so no changes are recommended. A timed UA scan was completed with #017 and the irradiance agreement was very good, reference graph next page. A portable 1000w UV lamp system was delivered by IOS and was tested versus laboratory lamp system at Izaña using local lamps. The comparison results are not known at this time.

Servicing:

Very little servicing was necessary. The micrometer gears were cleaned and the pushrod bearings were oiled. The leveling of the tracker was improved slightly but the tracking had been good prior to this.

Recommendation:

To correct the past years ozone data of #157 consideration should be given to using revised absorption coefficients for the wavelengths being used. However it may be difficult to determine what period should be corrected. From the dispersion results the coefficients at step 288 would be 0.337 and 1.1343 for ozone/SO₂. Sun scans (~6) should be completed every 3 months or just before and after Hg lamp change to monitor proper wavelength operation.

