FINEST SELECTION

AMPAD
Gold Fibre®

Computation Book

NAME MOBY NET # 2

COURSE _____

Numbered pages to track information
Fine quality heavyweight paper

11¾" x 9¼"
Ruled 4 squares/inch
76 Numbered Sheets

REV

TOPS™ PRODUCTS

12/1/2016

Draft Test plans for SQM radiance time series

SQM

120 V AC on. Remove white Fiducial →→ = "none"
start SQM program, update settings. 10 sec intervals ?
start logging window
- select DUT's.
note only 1 "other" can be selected
- when done "SAVE & CONTINUE"

input 120 V ac time from logsheet
- Immediately select the correct DUT - the one that is in/observing
(start w/ NONE)

Rotate to standby, update time on GUI
" " HI = 3A = 1A (I'm going to start w/ 1A)
note time to HI in logsheet

- Comments can be added anytime

Overall

Check WF does not saturate the int. PD's

SQM @ HI - 30 min warm up

WF, VXR, MBY CAS, UV CAS, SEI - only 4 inst. can view SQM
412-870 350-1100 200-870 350-2500

Day 1 - during warmup figure out T's etc. @ HI
after that, take lens cap background & ambients using 3"
disc during warmup
then signals.
once know T's for all levels :

Lamps on	SQM & lamp Status	Instrument Tasks
ϕ	off	Lens cap background at all T's we will need
1A, 3A	HI, warm up 30min	ambient @ HI Taus
	HI	signal @ HI Taus ← white Fiducial ~5 min
3A	MED, stabelize time ~10 min	ambient @ MED Taus
	MED	signal @ MED Taus ← white F. ~5 min
1A	LO, warm up, 30 min?	ambient @ LO Taus
	LO	signal ← White Fid
ϕ	off	Lens cap background at all T's ~5 min

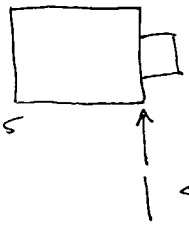
We will be monitoring the radiometer using NPL / NIL
and the 2065 filter.

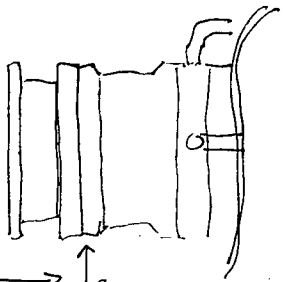
12/2/16

We will make a "cfg" file for each instrument for the SQM observations. It is not really an instr. conf., but more - inst. conf + set up info. That way, I don't have to document on the log sheets.

VXR/SQM

- mounted on vertical stage of "old_Y_one" Tag 544622 with the old motor and original stage. Later we are going to stiffen this stage.
- f/1.4, min focus 0.85
- new TEC controller @ 26°C
- chl 6 up
- distance:





d
102.3 cm

a
measure to here, later find vert front window

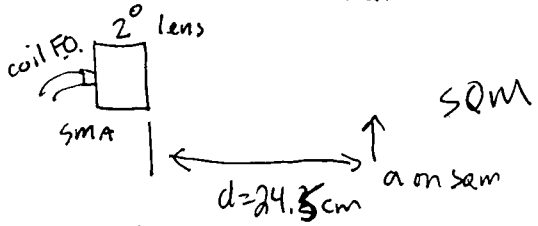
- VXR lens cleaned @ HEROES
- VXR chl 1 is flaky.

updated 12/8/16

12/1/16 cal y pos. (SQM) Big Table = ~~283.03~~ 285.23, 43.12
Old_Y_one = ~~43.06~~
small stage - ~~be left 620, 0.~~ 320, 0

MQBY-Not CAS Fiber | SEI SQM

Big Table Old Y one - ~~0,0~~ 15.34, 0
small stage ~~5.491 = x 70.227 = y~~
0, 80.12



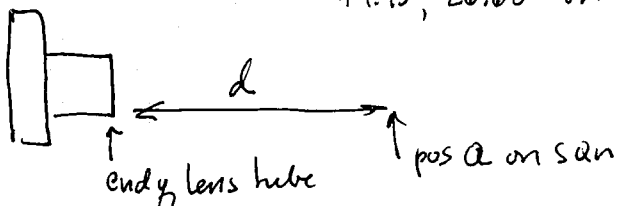
running SEI program

~~0,0~~ on Big table = 88.42, 0

~~19.13, 26.65~~ on stage = 0, 35.92

UV CAS & SQM

d = 20 cm



Foreoptic = Carl's Lens (UV CAS) green tape.

MBY CAS & SQM

d = 20

~~0,0 on Big table~~ 214, 14, 0

205.31, 30.32 on stage 0, 40.2

Foreoptics as UV cas except second system

12/2/16

SQM on - to get levels. file 001

SQM on - to test warm up file 002. Tried to use internal monitor's as radiometers, but they saturate with the WF ~~on~~ and SQM on HI.

→ Need to make a BF. (Blade fiducial)

UXR TEC off, cas', SEI, ASD off 22:00 12/2/16
" ON - " — ON 12/5/16 12 35 UTC

12/5/16 Monday was a not so good day

SQM to ~~HI~~ MED from A/C off state. Monitor w/ MOBY CAS; take data every 60 sec
Fil = 1, τ = 50 ms, # Acc = 100

SQM file ~~SQM12~~ 2016 SQM_20161202_001.txt
- has wrong dat - was always MOBY CAS
- AC off time is not working in the program, I need to enter a future time but can't seem to get it to take it.
- I was aiming for HI but did not turn knob enough so missed the level.
- the MOBY CAS head ~~does not~~ is not aligned and I did not notice this 'till I set up the ambient dues.
- The CAS INI file was evidently the UV one since the λ's ran to 870 and I had used the UV cas prior. But, I had selected MBY cas INI and it was displaying in the window.

→ ran ~ 2 hr. w/ MED & misaligned CAS and wrong INI
→ ran 3 sig, 1 amb w/MED & ~~HI~~ misaligned cas and correct INI.

12/6/16
Why is alignment off?
all 3 heads on scan are 1) too low
2) too far to the home position (too small)

Redid all dead reckoning calculations X (little table)
now looks ok mostly cos / scan. Y_two still looks low
to me
was 30.94 now 32.46. There is some problem in my
spreadsheet.
Decide to align radiometrically - using max DN w/ mostly cos

Currently, all txt files need correcting / verifying —

x	DOS	DN	50 ms
214.29	32.46	14200	no data saved.
	70.58	15450	approx = by eye - 42
	95.10	10,600	By fitting - ~~41.18~~ 41.51
			the y map
	100	1904	
	95	10,622	
	90	17,116	off by 8.72
	85	16,840	
	80	16,316	
	75	15860	Final value, from measurements - 40.2
	70	15390	(see p. 20-21)
	65	15000	
	60	14630	
	55	14400	
	50	14200	
	45	14100	
	40	14090	
	35	14150	
	30	14340	
	25	14620	
	20	15000	
	15	15450	
	10	16020	
	5	16700	
	0	17,500	

12/7/16

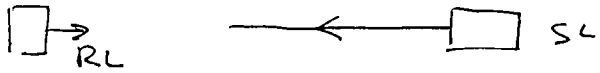
Test the calibration of the 2 y stages

Old Y-one move home → 304.8 should be 12"
measures 12"

Y-two move home → 101.6 should be 4"
measures 4"
so that is not my problem.

Set up a new spreadsheet which aims to layout (neatly) local coordinate systems on the source table and the radiometer table ~~for~~ which can then be used to find source / radiometer positions.

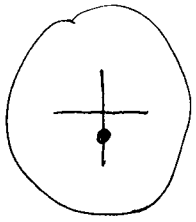
Note: SL is a very slightly high on RL, but it ~~is~~ is aligned

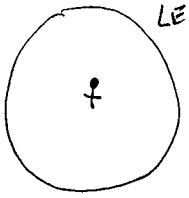


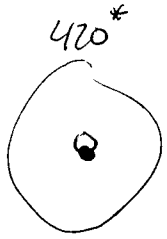
with the top of the posts and the spot on the wall.

$\Delta \approx 0.5$ mm

Look at RL1 to all sources:
SL - retro is right on, looks good
RL1 looks a little low on SL - this is consistent

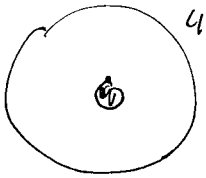


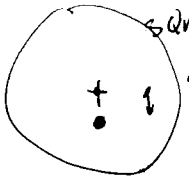




hard to set center, no cover

NPR



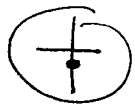


12/7/16

Searching for consistency

1. SL to VXR, get beam centered on wall through eyepiece: SL
   BT = 2055.80 old_Y_one = 38.80

2. SL to VXR, center beam on O on lens cap paper SL
   BT = 2057.44 old Y one = 38.80

3. RL to NPR  RL1 is low 1.5mm - confirmed.

4. Calculate BTX for VXR, NPR; 2504.55 uses positions & their separations from SL & RL1 work.

   Eyepiece: BTX = 2504.82 old_Y_one = 38.68 EP

38.80
- 38.68
0.12 mm, eq. is agreement. Thus, SL is 1.5 mm higher than RL.

New master spreadsheet is better - cleaner - Xpos_BigTable_NEW.xls

Have to remember to select both X,Y & X2,Y2 programs

Whew everything looks good now.

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measure γ-source w/ LW1 target w/ ASD, which is calibrated recently w/ NPR.

12/7/16 γ-Source on, look w/ Mem PD - S.M. has data
linearity test - the internal diode does not seem to be linear (SEM says)
Test 1 - 8 levels - gain 10^6
Test 2 - " 10^7
several more linearity runs
#39 & 41 = LEDs
448 nm 450 nm

12/8/16

NPR w/ everybody -

VXR; MBR cas, UV cas, SEI, Mon PD, RSL ASD, DWA cas, ~~UV/Vis~~.

12/9/16
Sent out files

- SQM files at the moment, go to C:\SQM Data and r:\r-prog ... SQM Data

12/9/16
Friday
Es #2 - out to 950 - manual fit above 630
smoothed - 10 pts.
75% of target
21:00 δ log file SpLED_2016 1209_205959 ~~Hard time~~

MOBY ~~Gas~~ Net w/ new Es
every 15 min over the weekend T=20 Fil=1 Acc=100
start w/ ambient 215428 - discard
213333 - discard
start over T=10 Fil=1 Acc=100
ambient 215252
signal 215335 → every 900 sec over weekend 19030 max
Bank 4 overhead lights on

Mon 12/12 last light scan 145331
ambient: 150831

12/12/16 measure LuBUT overnight w/ MOBY cas.

12/13/16 - finished LuBUT run 1412.

SQM Let's try Lo → med → HI to see about warmup times and repeat of levels from cold start (A/C off)

12/14/16

Repeat yesterday, but turn AC on and to standby (heaters on) in the morning & do Lo → MED → Hi sequence again, w/ at least 1 hr. ~~before cha~~ at each level.

What do we have so far - in terms of CAS MBE Ln calibration?

NPR:	$\tau = 20$,	Filter = 2
SQM	HI	$\tau = 50$, Filter = 1
SQM	MED	$\tau = 50$, Filter = 1
SQM	LO	$\tau = 50$, Filter = none
δLED:	LWI	50, 1
↓	E_s	15, 1
	LUBOT	30, 2

→ make a 2800 - 3000 k BB w/ LED source and measure at

Filter	τ
2	20, 30, 50
1	~~20~~ 15, 20, 30, 50
none	20, 30 50

10-30 Δθ files, amb, signal

used "NPR 10% target" and NPR ~~0.07%~~ target 0.02 = 2%

measure linearity at Filter 1 400 nm, 600 nm

1/16/17

SQM files to look at

LO ~~gg~~ Filter = 1 & none
MED Filter = 1
HI " "

} so we can make a time series of Fil. 1 & Fil none, and we can get 1/none ratio

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Header for Radiance head has:
col 6 ~~Source~~ Experiment
of interest:
~~test~~ Gamma_source_NPR10 percent
SQM_time_series
LO_MED_HI_test
col 7 Source
NPR
SQM
col 9 Optic
E-head
Other
entire alt: start wave - 5 unique values

It looks like NPR was run w/ the wrong IDL file — 297.055 to 1100.421 on Dec. 8.

There are DRA cas files in here:

CAS_161208_154812, 4835, 4858, 4957, 5030, 5702
move to a temp. place.

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17 Jan.
We measured SQM on Filt. 1 & none (LO), Fil for MED, HI
→ get OD Fil 1 =

T_1 = trans. ~~of~~ Fil 1 = S_1/S_0

T_2 = trans of Fil 2 = $S_2/S_0 = S_2/S_1 \cdot S_1/S_0$

we have S_2/S_1 from γ source.

we have a portion of S_1/S_0 from γ source

Jan 17, 2017
Saves a file MBY_CAS_FiltTau.mat
$x = \lambda$ nm
y_1 = transmittance of Fil 1 ~0.1
y_2 = " " Fil 2 ~0.01

To calibrate SQM

Fil 2 1. NPR (Fil 2) / $T_{Fil\,2}$ = NPR DNs @ Fil ∅

Fil 1 2. SQM (LO, MED, HI) / $T_{Fil\,1}$ = SQM @ Fil ∅

Fil ∅ 3. SQM (LO) = SQM @ Fil ∅

then $L_{sqm}(HI, MED, LO) = L(NPR) \cdot \frac{S_{sqm}}{S_{NPR}}$

See write up 01-16-2017_report-log.docx

Many things to fix

(1) Streamline processing

all files → list → tag columns of processing → use Main sheet for everything, including matchups (Signal, Gain) if possible