[ 1] 'v\_ibio\_Colorimetry': .......................................... [000.34 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 2] 'v\_ibio\_stockman2xyz': ......................................... [000.33 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 3] 'v\_ibio\_cmCurrentImpulse': ..................................... [002.18 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

Passing to fractional tolerance of 3e-4. But, the plot that comes up at the end seems like what’s computed locally and what is plotted by the object differ in an unfortunate way. This was

true on the ISETBio branch as well. Could this be related to the fact that mean luminance is not actually being set to 50 in the oisCreate impulse code?

[ 4] 'v\_ibio\_cmosaic': .............................................. [000.60 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 5] 'v\_ibio\_conesrect': ............................................ [001.90 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 6] 'v\_PTBcalStructToIsetbioDisplayObjectAndBack': ................. [000.07 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 7] 'v\_ibio\_DisplayColorConversion': ............................... [000.27 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 8] 'v\_ibio\_DisplayLUTinversion': .................................. [000.17 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 9] 'v\_ibio\_PTBcalStructToIsetbioDisplayObjectAndBack': ............ [000.05 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 10] 'v\_ibio\_eyeMovementsPhysio': ................................... [000.00 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 11] 'v\_ibio\_HumanRetinalIlluminance580nm': ......................... [000.18 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 12] 'v\_ibio\_OTFandPupilSize': ...................................... [010.12 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 13] 'v\_ibio\_oi': ................................................... [000.79 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields)

Now get good agreement on dev-width branch. Should change and rewrite validation files to base angular width on focal length not distance to in-focus plane.

[ 14 'v\_ibio\_oiTransmittance': ...................................... [000.78 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 15] 'v\_ibio\_oiSequence': ........................................... [001.62 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 16] 'v\_ibio\_osEMData': ............................................. [001.48 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 17] 'v\_ibio\_osIncDec': ............................................. [005.55 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 18] 'v\_ibio\_osLinearFilters': ...................................... [002.66 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 19] 'v\_ibio\_osStep': ............................................... [007.21 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 20] 'v\_ibio\_osStepFlash': .......................................... [010.53 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 21 'v\_ibio\_osTimeStep': ........................................... [009.83 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 22] 'v\_ibio\_IrradianceIsomerizations': ............................. [001.95 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 26] 'v\_ibio\_statsPoisson': ......................................... [000.90 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

[ 27] 'v\_ibio\_wvfComputeConePSF': .................................... [010.24 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ;

Problem was that default pupil function compute does not incorporate human LCA - this needs to be set by a key-value pair in the wvfCompute for the ISETCam branch. May want

to worry about whether there are places we should be do that.

[ 28] 'v\_ibio\_wvfDiffractionPSF': .................................... [000.54 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

Got this to pass with tolerance fraction of 0.0002. Close enough.

[ 29] 'v\_ibio\_wvfSpatialSampling': ................................... [000.11 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 30] 'v\_ibio\_wvfStilesCrawford': .................................... [013.88 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

[ 31] 'v\_ibio\_wvfZernikePolynomials': ................................ [000.29 secs] Internal validation: PASSED ; Runtime status: NO EXCEPTION RAISED ; Fast validation: NoTest ; Full validation: PASSED ; (using custom tolerances for some fields);

Had to comment out some broken wvfPlot calls. These need to be fixed but are not a numerical issue per se.

Worried about needing to call wvfComputePupilFunction and wvfComputePSF over and over again. Used to be cached for speed. Should replace with wvfCompute in any case, and watch out for correct key value pairs on

LCA and SCE.

The rgc validations were not being run on the ISETBio master. I think those date back to James Golden and bear no relation to anything we currently care about.

Need to think about:

1) opticsGet - lensmakers formula in image/focal plane distance for SI? We think this is right

2) oiGet - we think we should get the focal length not distance to image plane to compute angular height and width.

3) oiGet - maybe should not allow asking for distance to image/focal plane without saying specifically what sDist is.

4) opticsGet - check comment on RTeffective focal length.

5) cos4th line 40. Should this be focal length?

6) oiGet angular resolution based on fL. This may be solved when we think about 2 above.

7) We have 1.2 hard coded as the default for sDist in oiGet and that is not good.