Posting type Information

Subject Changes/upgrades in HIPS system resulting in calibration changes

Module/Species A/ Fabs

Sites Entire network

Period Jan 2017 to present

Recommendation None

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Supporting information

The first table below summarizes the changes and updates made to the UC Davis HIPS system providing light absorption measurements for IMPROVE network.

Lab Date	Change	Reason	Comments
5/9/2017	HIPS moved to room 208	Instrument moved to new lab to help with environmental light and vibration issues.	
~10/1/2017	Change of the laser in the system.	The old HeNe laser lost power output and a new HeNe laser was purchased and installed.	New laser is Thor Labs model HNL050R, 5 mW 632.8 nm.
3/7/2018	Replacement of old 2 inch integrating sphere with newer 4 inch sphere.	Old sphere was dirty and it was thought better consistency would be gained with the larger sphere.	Old sphere was a 2 inch Labsphere Spectraflect model. The new sphere is a 4 inch Labsphere Spectralon model.
3/26/2018	Removed the black pipe between laser and integrating sphere.	The pipe was used to house a diffuser and optics which are no longer used. The assembly was removed to address light leakage and alignment issues.	
8/24/2018	Replaced reflectance and transmittance detectors and their power meters.	Detectors were over 30 years old, and the transmittance detector was losing stability.	New power meter is a dual input Newport 2936-R. Reflectance detector is a Si photodiode with a built in OD 3 neutral density filter, Newport 918D-SL-OD3R. Transmittance detector is the same but with an OD2 filter, Newport 918D-SL-OD2R.
8/24/2018 – 10/22/2018	Tested various iterations of neutral density filters and diffusers for the integrating plate.	Old plate optics (neutral density filter and opal glass diffuser) did not fit the lens tube for the new transmittance detector. They were replaced with 2 inch optics which fit the new lens tube.	Final plate optics arrangement is a 0.6 OD neutral density filter at the end of the lens tube closest to the sample filter with an opal glass diffuser directly behind it. Both mounted on a 0.5 inch long 2 inch diameter lens tube connected to the detector via a short adapter.

Lab Date	Change	Reason	Comments
5/9/2017	HIPS moved to room 208	Instrument moved to new lab to help with environmental light and vibration issues.	
11/08/2018	Start routine use of new detectors and integrating plate.	Testing complete and routine sample analysis began.	

The following table relates the HIPS system changes outlined above to sample analyses and data reporting.

Network	Sample Dates	HIPS Analysis Dates	HIPS data changes
IMPROVE	January 2003 through December 2016	Prior to April 2017	None: as described in White et al. (2016)
IMPROVE	January 2017 through February 2018	4/12/2018 – 8/17/2018	Reported with new calibration reflecting installation of 4 inch sphere and removal of diffuser tube assembly.
IMPROVE	March 2018 to present	11/16/2018 - present	Reported after recalibration for new detectors and integrating plate optics.

The possible effects on the data due to modifications and new calibrations will be evaluated and reported in an upcoming data advisory.