Measurements With MAVOSPHERE Integrating Sphere



1/07.14



This document describes the measurement procedure for MAVOSPEC in combination with MAVOSPHERE 205, MAVOSPHERE 500, MAVOSPHERE 1100 and MAVOSPHERE 2000.

1 Configuration of measurement workplace

Equipment used for the measurement consists of:

- MAVOSPHERE together with spectrometer MAVOSPEC
- USB source controller (sphere controller)
- PC with installed and configured GL Spectrosoft

During factory calibration process, the calibration profile for MAVOSPHERE had been stored in memory of spectrometer used for calibration. MAVOSPHERE gives correct results only when used together with the spectrometer containing the valid profile for this specific sphere.

Before executing measurements the sphere adapter must be mounted on MAVOSPEC and then spectrometer must be installed in an appropriate port of the sphere. Afterwards the spectrometer has to be connected to the PC via USB cable.

The auxiliary light source, which is part of the MAVOSPHERE, should be connected to the sphere controller with the Jack connector. The sphere controller must be connected to the PC with USB cable as well as to the power. The power switch should be turned on.

Please check the number of COM port on PC which is associated with the sphere controller. This number must be configured in GL SpectroSoft as described in chapter 2 before the measurements could be executed.

Before actual measurementscan be executed, the dark current calibration procedure must be done. The dark current procedure is described in the MAVOSPEC manual.

2 The calibration of the self absorption

Before further steps, the support for the sphere controller must be enabled in the MAVOSPEC settings.



Press device preferences button to edit device settings.

Device	Autosave	
	Autosave ON	
Spectis louch	Period 2	÷ minutes
Preferences	Max file count	5 -
-Color Dominant Reference Point	Measurement names -	
x 0.3333	Use pattern name	s
у 0.3333	Pattern m%	05d
Report	Current 1	
HTML Report System	External software com	munication
Width 600	Calculate and rela	v
Height 300	Minimize after star	ť
Behaviour	Relay	
Continuous measurement with voice	Measure delay	5
Rel Y view	Backgroud delay	5
	ID	1
Correction of calibration		
		Load from file

In order to enable sphere controller port click the box "Sphere controller settings" and then type in the proper COM port number.

NOTE: If you do not know the port number of COM port, run Windows Control Panel/ Devices and Printers and check the USB <-> Serial COM port No.

<u>.</u>	5ettings v.1.0.08	3		
	Connection type			
	USB			-
	IP	127.0.0.1		
	Sphere contro Controller COM p Calibration delay Measurement del	ller settings ort [ms] ay [ms] OK	25 3000 500 Can	

Make sure that the dark current calibration has been done.

NOTE: When making dark current calibration, cover the entrance aperture in the sphere to cut off the ambient light.



When the proper adapter is mounted to the MAVOSPEC, the Menu "Sphere Correction" will be displayed in Quick config panel.



Before performing the actual self-absorption procedure, start the procedure with the open sphere and check if the auxiliary light source is being turned on during the measurement, as well as the yellow diode on Sphere Controller. If not, the wiring of Sphere Controller as well as settings of COM port has to be checked.

When the auxiliary light source works correctly, remove the DUT (Device Under Test) from the sphere together with the post, open Sphere correction dialog once again and click the Next button.

NOTE: Cover the entrance aperture to cut off the ambient light.

He bet Actor Window loos Calibration Hep Open Save group Zoom max Measure Continuous Interwal 0,0 Interwal 0,0
Open Save group Zoom max Measure AIN Continuous Image: Continuous
All X UV X R X G X B1 X mixed X Measurement B X 4 4 Sphere correction ? X 1 nm Imm 80 2 2 2 2 70 Measurement of the empty sphere 2 2 60 Measurement from the sphere 3 3 7 Measurement from the sphere 3 3 7 Measurement from the sphere 5 4 7 Measurement from the sphere 3 4 10 Measurement from the sphere 4
Image: sphere correction ? × 1 nm [mW/m²/nm] Self - Absorption calibration 2 80 Measurement of the empty sphere 2 70 Measurement of the empty sphere 2 60 Remove measured element from the sphere and press button Next * 30 • • 10 • •
Self - Absorption calibration 2 80 Measurement of the empty sphere 70 Measurement of the empty sphere 60 Remove measured element from the sphere 40 Remove measured element from the sphere and press button Next 30 Image: Status 20 Image: Status 10 Image: Status
30
60 50 40 40 30
50 Image: Constraint of the system 40 Remove measured element from the sphere and press button Next 30 Image: Constraint of the system 20 Image: Constraint of the system 10 Image: Constraint of the system
40 Remove measured element from the sphere and press button Next 30
30
20
10
350 400 450 <a> <a< td=""></a<>
jart jart
Pos Name X2 Y2 u2 v2 L2 a2 b2 X2 Y2 Z2 x10 y10 y10 u10 4 B1 0.1019 0.1056 0.1424 0.2386 38.83 24.41 .87.37 290.20 216.10 1539.47 0.1547 0.1547 0.1547 0.1168

Measurement screen.

🚮 GL_S	pectroSoft															_ 🗆 🗙	
File Edi	it Action Wir	ndow Tools Ca	libration He	lp													
Open	Save group	Coom max M	leasure Co	ntinuous	Interwał	0,0	÷ Lic	zba 0		Config	T 6	2 %	T/R	AMB	Const AMB	Rel »	
	All 🗙 🚺 UV 🗶 📄 R 🗶 🚺 📴 G 🗶 🚺 🖪 1 🗶 🖬 mixed 🔀 📜 Measurement																
Sphere correction											? ×		1 nm		-		
[mW/m	nW/m²/nm] Self - Absorption calibration Measurement of the empty sphere												2		÷		
00 70 60 50 40 30 20 10 0	Measurement of the empty sphere										Status	Selecte	d results & X				
	330	400 400											hart			a v	
Compariso	on			1		1		1	1	-	1	1		1			
Po	IS .	Name	x2	y2	u2'	v2'	L2	a2	b2	X2	Y2	Z2	x10	y10	y10	u10 ▲	
4	B1		0,1419	0,1056	0,1424	0,2386	38,83	24,41	-87,37	290,20	216,10	1539,47	0,1340	0,1547	0,1547	0,1168	
Device : 0	Connection: Clie	nt: 127.0.0.1														0%	

In the second step install the DUT. The measured light source (DUT) has to be switched off. Only the auxiliary light source mounted in MAVOSPHERE will be used for this measurement. Run the measurement by clicking the Next button.

GL_SpectroSoft	n Heln												_ 🗆 🗙
Open Save group Zoom max Measur	e Continuous	Interwał	0,0	÷ Lic	zba 0	T T	Config	т б	2 %	T/R	AMB (Const AMB	Rel »
All 🛛 📔 UV 🖂 📔 R 🗶 📔 G 🖾 🚺 B1 🗶 🖬 mixed 🔀 📜 Measurement													₽×
Sphere correction											1 nm		
[mW/m ² /nm] Self - Absorption calibration Measurement of the tested light source											2		•
80 Install measured element in the sphere and press button Next 30 Image: sphere and press button Next 10 Image: sphere and press button Next											 d results ∂ ×		
Comparison										hart			₽×
Pos Name	x2 y2	u2'	v2'	L2	a2	b2	X2	Y2	Z2	x10	y10	y10	u10 ▲
4 B1 0,1	419 0,1056	0,1424	0,2386	38,83	24,41	-87,37	290,20	216,10	1539,47	0,1340	0,1547	0,1547	0,1168
[•]													
Device : Connection: Client : 127.0.0.1													0%

The next step is to specify the name of the correction file. The software by default is suggesting the existing name from the list. You can copy the name of the correction file by clicking the existing name. When the name is set click the Finish button.

At this stage it is also possible to remove unwanted existing correction files. Select the file and click Delete selected button.

GL_ File E	_SpectroSoft dit Action W	/indow Tools Calil	oration He	lp												<u> </u>
Ope	n Save group	Zoom max Me	asure Co	ntinuous	Interwał	0,0	÷ Lic	zba 0	* *	Config	T 6	2 %	T/R	AMB C	Const AMB	Rel »
	All 🗙 📕 UV 🗶 📕 R 🗶 📕 G 🗶 📕 B 1 🗶 🖬 mixed 🔀 📃 Measurement															₽×
<u> </u>	Sphere correction											1 nm		-		
[mW/	m²/nm]		Self - A Ca	Absorpti Iculation o	on calibra of the corre	ation action file								2		•
7	0					Sav	e new	correcti	on							
6	0		Existi	ng correct	tions											
			new	correctio	n											
6	0												and the second sec			
4	0												kesuits .	Status		
3	0															° ^
										De	elete selete	:d	-			
2	0		File	name n	ew_correct	tion							anh T			
1	0	-											spn 💽			
	0												-			
	350	400 450						< Back		Finish	Can	cel				
													part			
Compar	ison		-			1 .	1	1	1 .	1	1	1	1	1		
	05	Name	x2	¥2	u2'	v2'	L2	a2	b2	X2	Y2	Z2	x10	y10	y10	u10
4	81		0,1419	0,1056	0,1424	0,2386	38,83	24,41	-87,37	290,20	216,10	1539,47	0,1340	0,1547	0,1547	U,1108
Device	Connection: C	ient : 127.0.0.1														0% ///

The new correction file will be available on the Sphere correction list in Quick Config panel.



3 The actual measurement of light source

Now the device is ready for the actual measuring of the light source (DUT). Connect measured light source to the power, check if the right correction is selected in Sphere correction list and start the measurements.

The self absorption procedure should be carried out each time when the absorption of elements mounted in MAVOSPHERE is changing, e.g. another light source is mounted, or position of measured light source in the sphere is significantly changed.

Printed in Germany – Subject to change without notice

GOSSEN Foto- und Lichtmesstechnik GmbH | Lina-Ammon-Str.22 | D-90471 Nürnberg | Germany Telefon: +49 911 8602-181 | Fax: +49 911 8602-142 | E-Mail: info@gossen-photo.de

www.gossen-photo.de