

Laboratory book C112

C112 Crew

June 27, 2016

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June 2016

June 2016

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June 2016

2016-6-15 Axial of line ratio wavelength

?? ignition of discharge

gas helium nitrogen mixture

flow helium 100 sccm

- nitrogen 0.05 sccm

pressure $p = 1000$ mbar

frequency $f = 5$ kHz

shape square wave

amplitude $\hat{U}_{\text{appl}} = 1200$ V

?? measurement of Stark splitting

lens $h_{\text{lens}} = 7.2 : 0.05 : 5.8$ in

hor. slit $s_{\text{hor}} = 0.2$ mm

filter OG1 filter

MC $s_{\text{MC,in}} = 1$ mm

- $s_{\text{MC,out}} = 1$ mm
- $g_{\text{MC}} = 1800 \text{ mm}^{-1}$ at 500 nm
- $\lambda_{\text{MC}} = [587.65, 667.98, 690.0, 706.66, 728.31] \text{ nm}$

R&S RTO 1024 sample Rate: 500 MSa/s

- resolution: 2 ns
- record length: 2 kSa
- acquisition time: 4 μs
- CH1: applied voltage, 200 V/DIV
- CH2: total charge, 4 V/DIV
- CH3: PMT signal, 40 mV/DIV, -160 mV offset
- CH4: Rogowski coil, 100 mV/DIV
- trigger: CH4 at -150 mV, falling slope
- 15000 averages

PC 5 total wavelength scans at each position

Files 16001:16725

?? measurement of full period

Files 17001

2016-6-20 line intensity ratio

??	ignition of discharge
gas	pure helium
flow	helium 100 sccm
pressure	$p = 1000 \text{ mbar}$
frequency	$f = 5 \text{ kHz}$
shape	sine wave
amplitude	$\hat{U}_{\text{appl}} = 1200 \text{ V}$

??	line intensity ratio
lens	$h_{\text{lens}} = 5.8 : 0.05 : 7.2 \text{ in}$
hor. slit	$s_{\text{hor}} = 0.2 \text{ mm}$
filter	OG1 filter
MC	$s_{\text{MC,in}} = 1 \text{ mm}$ <ul style="list-style-type: none">• $s_{\text{MC,out}} = 1 \text{ mm}$• $g_{\text{MC}} = 1800 \text{ mm}^{-1}$ at 500 nm• $\lambda_{\text{MC}} = [587.65, 667.98, 690.0, 706.66, 728.31] \text{ nm}$

R&S RTO 1024	sample Rate: 100 MSa/s <ul style="list-style-type: none">• resolution: 10 ns• record length: 2 kSa• acquisition time: 20 μs• temporal window: from $-6 \mu\text{s}$ to 14 μs• CH1: applied voltage, 200 V/DIV• CH2: total charge, 2 V/DIV• CH3: PMT signal, 40 mV/DIV, -160 mV offset• CH4: Rogowski coil, 40 mV/DIV• trigger: CH2 at 3.5, V, rising slope• 28000 averages
PC	10 total wavelength scans at each position
Files	30000:31450

2016-6-22 Stark spectroscopy

?? ignition of discharge

gas helium with small admixture of nitrogen

flow helium 100 sccm

- nitrogen 0.05 sccm

pressure $p = 1000$ mbar

frequency $f = 5$ kHz

shape square wave

amplitude $\hat{U}_{\text{appl}} = 1200$ V

?? Stark spectroscopy

lens $h_{\text{lens}} = 6.8 : 0.1 : 7.1$ in

hor. slit $s_{\text{hor}} = 0.2$ mm

filter polarization filter

MC $s_{\text{MC,in}} = 0.1$ mm

- $s_{\text{MC,out}} = 0.1$ mm
- $g_{\text{MC}} = 2400 \text{ mm}^{-1}$ at 500 nm
- $\lambda_{\text{MC}} = 491.8 : 0.02 : 492.5$ nm

R&S RTO 1024 sample Rate: 500 MSa/s

- resolution: 2 ns
- record length: 1 kSa
- acquisition time: 2 μs
- temporal window: from $-0.6 \mu\text{s}$ to $1.4 \mu\text{s}$
- CH1: applied voltage, 200 V/DIV
- CH2: total charge, 4 V/DIV
- CH3: PMT signal, 40 mV/DIV, -160 mV offset
- CH4: Rogowski coil, 100 mV/DIV
- trigger: CH2 at 150 mV, falling slope
- 50000 averages

PC 10 wavelength scans (inner loop) at each position

Files 35000:36440

2016-6-27 Stark spectroscopy

??	ignition of discharge
gas	pure helium
flow	helium 100 sccm
pressure	$p = 1000 \text{ mbar}$
frequency	$f = 5 \text{ kHz}$
shape	sine wave
amplitude	$\hat{U}_{\text{appl}} = 1200 \text{ V}$

??	Stark spectroscopy
lens	$h_{\text{lens}} = 6.8 : 0.1 : 7.1 \text{ in}$
hor. slit	$s_{\text{hor}} = 0.2 \text{ mm}$
filter	polarization filter
MC	$s_{\text{MC,in}} = 0.1 \text{ mm}$ <ul style="list-style-type: none">$s_{\text{MC,out}} = 0.1 \text{ mm}$$g_{\text{MC}} = 2400 \text{ mm}^{-1}$ at 500 nm$\lambda_{\text{MC}} = 491.8 : 0.02 : 492.5 \text{ nm}$
photomultiplier	-1250 V
amplifier	30 db

R&S RTO 1024	sample Rate: 100 MSa/s <ul style="list-style-type: none">resolution: 10 nsrecord length: 2 kSaacquisition time: $20 \mu\text{s}$temporal window: from $-8 \mu\text{s}$ to $12 \mu\text{s}$CH1: applied voltage, 200 V/DIVCH2: total charge, 2 V/DIVCH3: PMT signal, 200 mV/DIV, -800 mV offsetCH4: Rogowski coil, 20 mV/DIVtrigger: CH2 at 3.5 V, rising slope28000 averages
PC	15 wavelength scans (inner loop) at each position
Files	50000:51440