Laboratory book C112

C112 Crew

June 22, 2016

Contents

June 2016

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 $p = 1000\,\text{mbar}$

frequency $f = 5\,\text{kHz}$

shape square wave

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

?? measurement of Stark splitting

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

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

filter OG1 filter

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

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

R&S RTO 1024   sample Rate: 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	$s_{\text{MC,in}} = 1\,\text{mm}$

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

R&S RTO 1024   sample Rate: $100\,\text{MSa/s}$

- resolution: $10\,\text{ns}$
- record length: $2\,\text{kSa}$
- acquisition time: $20\,\mu\text{s}$
- temporal window: from $-6\,\mu\text{s}$ to $14\,\mu\text{s}$
- CH1: applied voltage, $200\,\text{V/DIV}$
- CH2: total charge, $2\,\text{V/DIV}$
- CH3: PMT signal, $40\,\text{mV/DIV}$, $-160\,\text{mV}$ offset
- CH4: Rogowski coil, $40\,\text{mV/DIV}$
- trigger: CH2 at $3.5,\text{V}$, 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	$p = 1000\,\text{mbar}$
frequency	$f = 5\,\text{kHz}$
shape	square 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	$s_{\text{MC,in}} = 0.1\,\text{mm}$
•	$s_{\text{MC,out}} = 0.1\,\text{mm}$
•	$g_{\text{MC}} = 2400\,\text{mm}^{-1}$ at $500\,\text{nm}$
•	$\lambda_{\text{MC}} = 491.8 : 0.02 : 492.5\,\text{nm}$

R&S RTO 1024	sample Rate: $500\,\text{MSa/s}$
•	resolution: $2\,\text{ns}$
•	record length: $1\,\text{kSa}$
•	acquisition time: $2\,\mu\text{s}$
•	temporal window: from $-0.6\,\mu\text{s}$ to $1.4\,\mu\text{s}$
•	CH1: applied voltage, $200\,\text{V/DIV}$
•	CH2: total charge, $4\,\text{V/DIV}$
•	CH3: PMT signal, $40\,\text{mV/DIV}$, $-160\,\text{mV}$ offset
•	CH4: Rogowski coil, $100\,\text{mV/DIV}$
•	trigger: CH2 at $150\,\text{mV}$, falling slope
•	50000 averages
PC	10 wavelength scans (inner loop) at each position

Files	35000:36440