Laser Chain status:

Amp1 &Harmonic generation details

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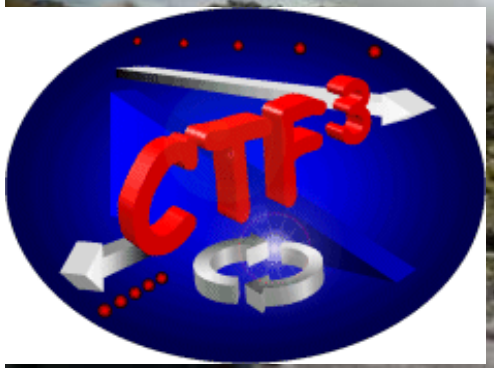
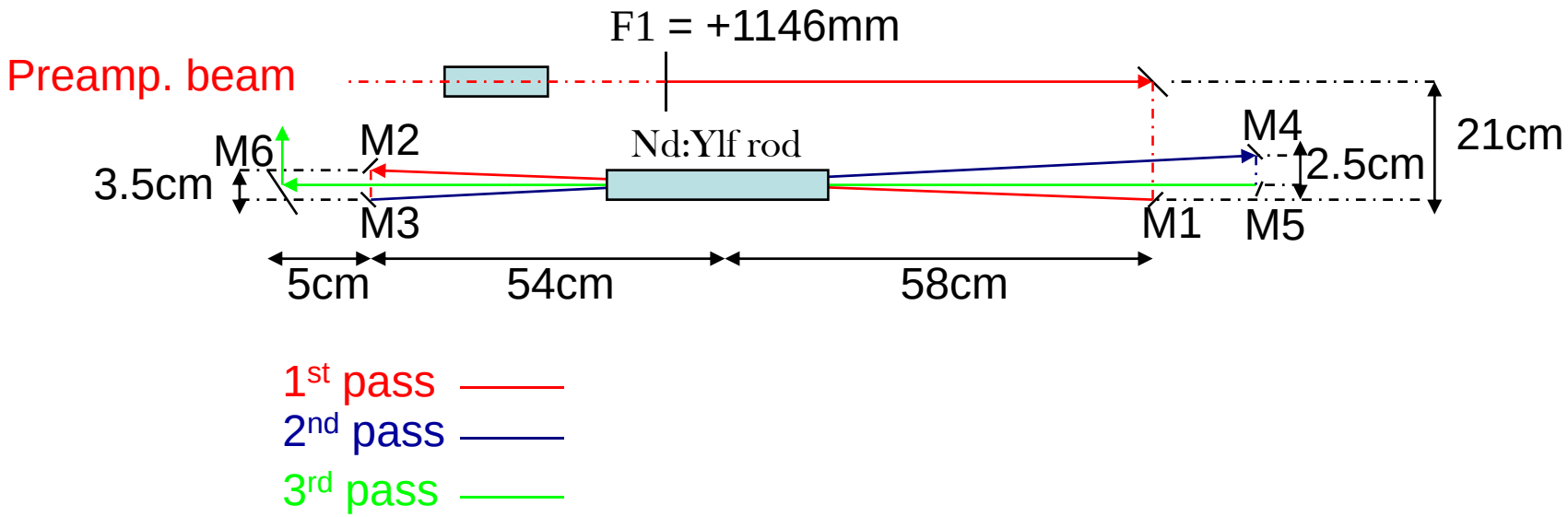


First Amplifier layout

-After the discovery of Amp1 problems (thanks to harmonic generation + scope) the Amp1 design has been revised and changed: 3 different configuration.



-Final configuration: 3 passages trough the rod with F1 to ~ compensate for the beam divergence: X(3rd pass)-X(1st pass)~1.2mm; Y(3rd pass)-Y(1st pass)~1mm .

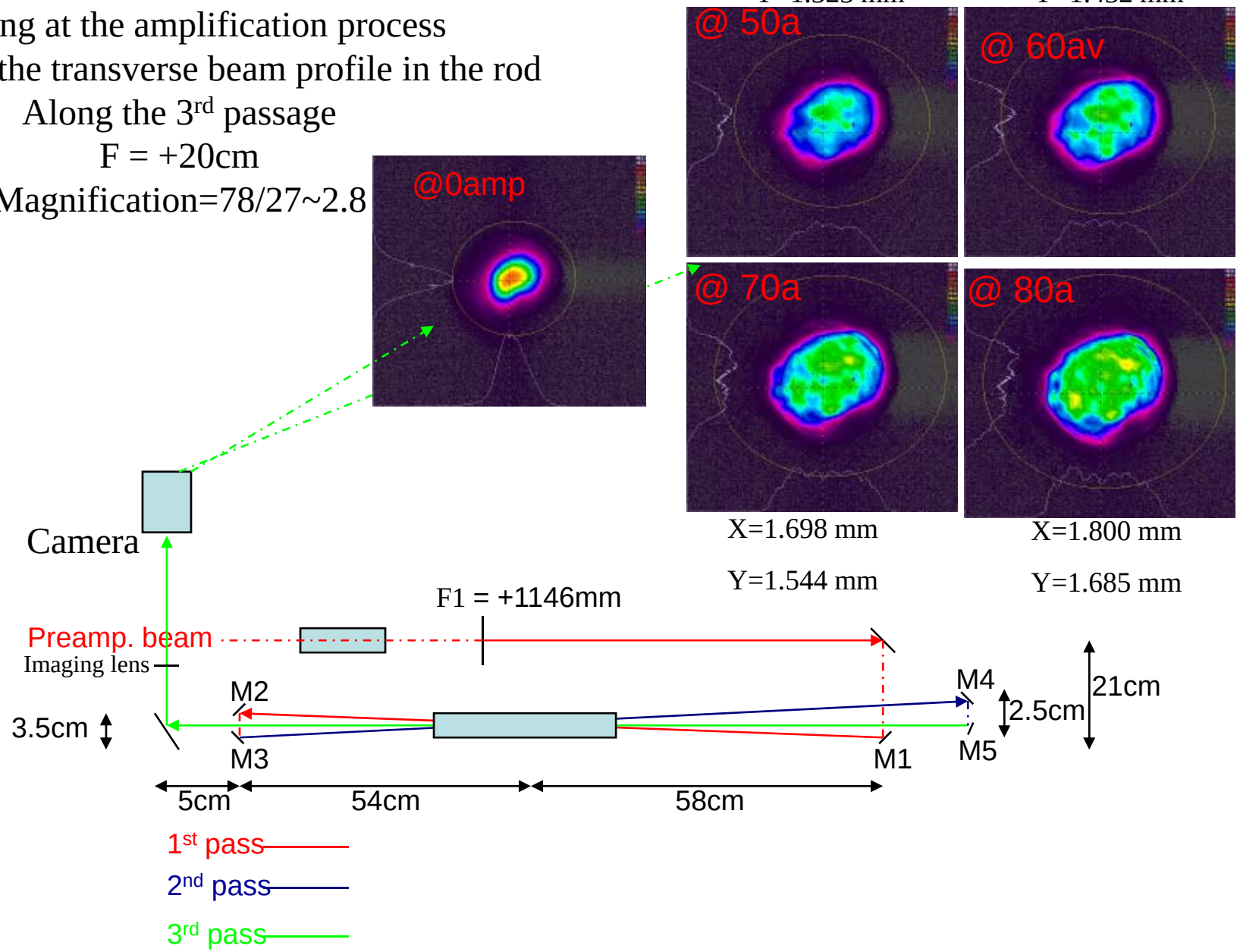
Nominal power ~3KW has been reached with 85amp

Satisfactory trace pulse stability has been reached

Transverse beam parameters: M^2_x~2.38; M^2_x~1.94

Imaging the rod center

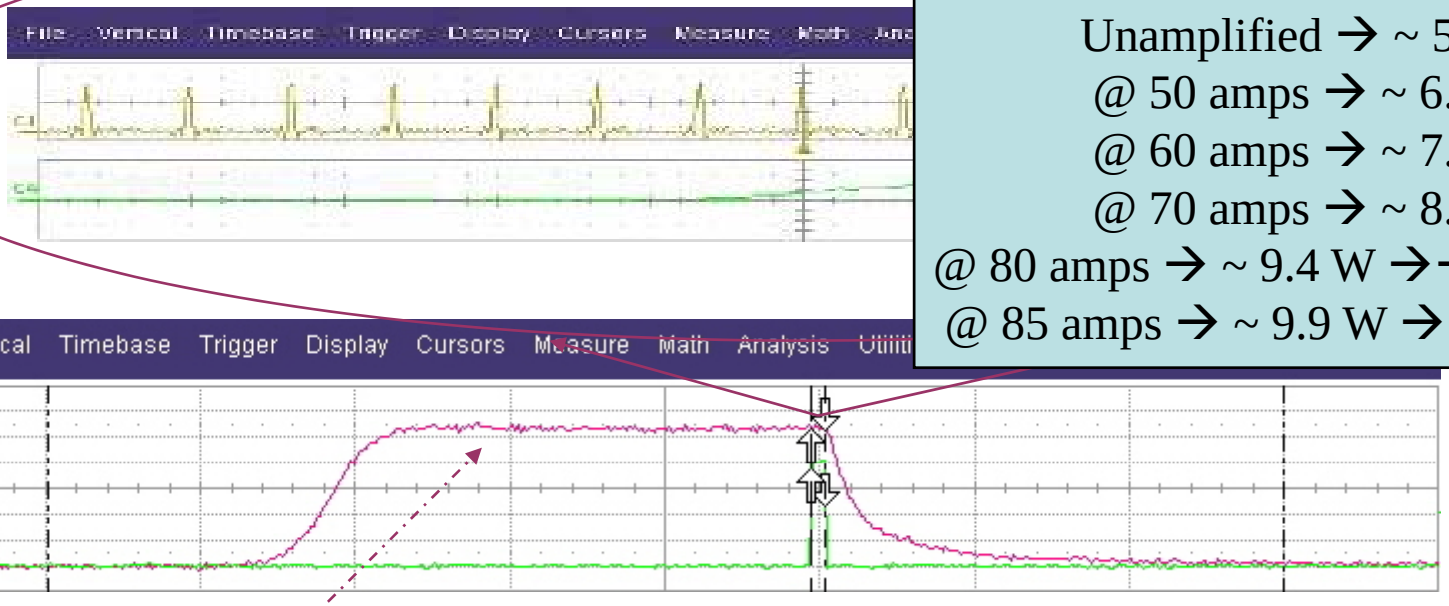
Looking at the amplification process
By imaging the transverse beam profile in the rod
Along the 3rd passage
F = +20cm
Magnification=78/27~2.8

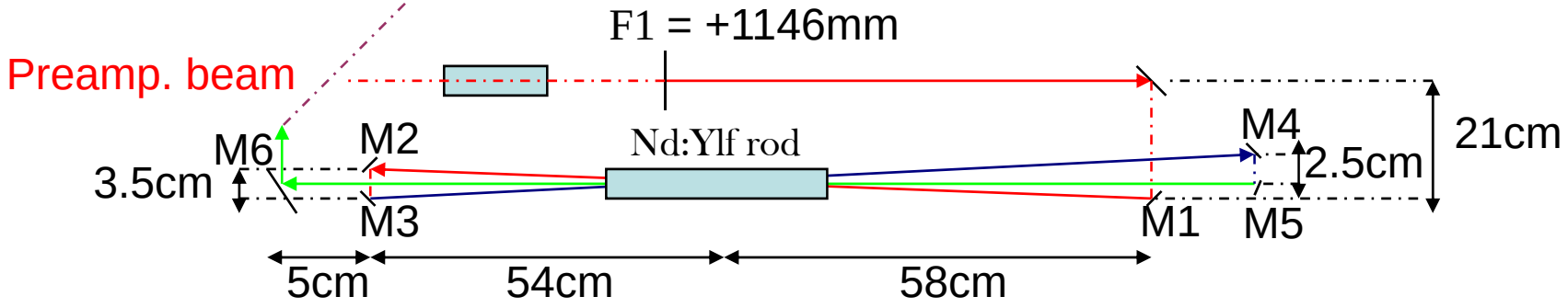


Temporal Profile & Power

Power Masurements:

Unamplified → ~ 5.4 W
@ 50 amps → ~ 6.6 W
@ 60 amps → ~ 7.5 W
@ 70 amps → ~ 8.4 W
@ 80 amps → ~ 9.4 W →→ ~2.75 KW
@ 85 amps → ~ 9.9 W →→ ~3.1 KW

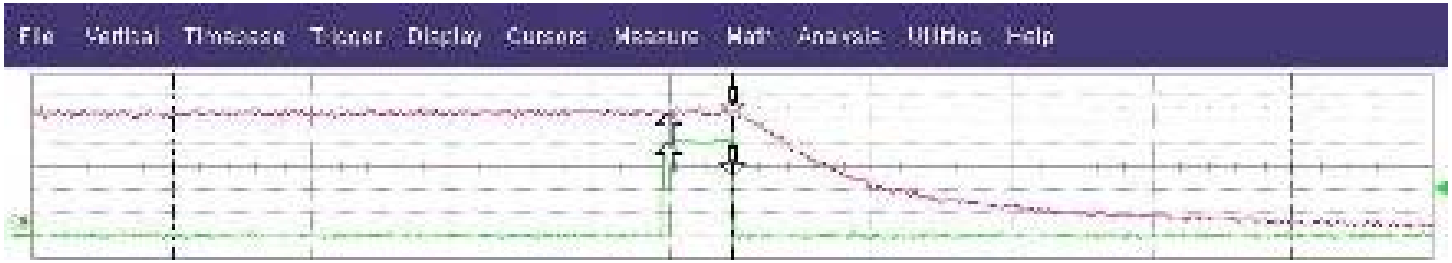




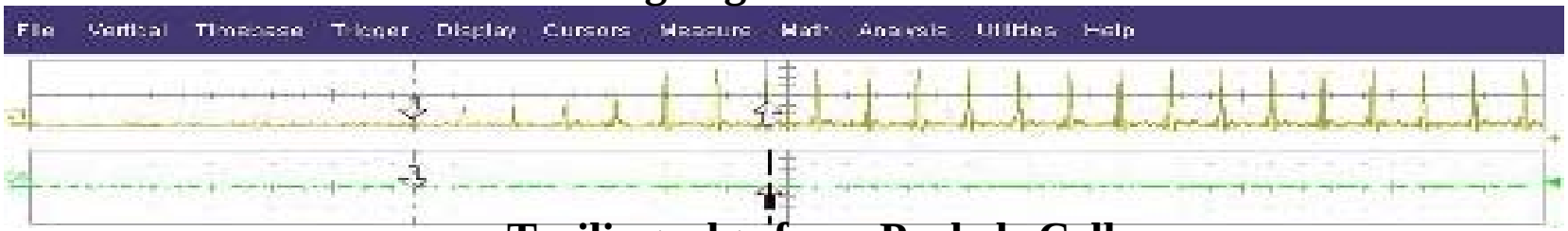
1st pass
2nd pass
3rd pass

Temporal Profile after Pockel Cell

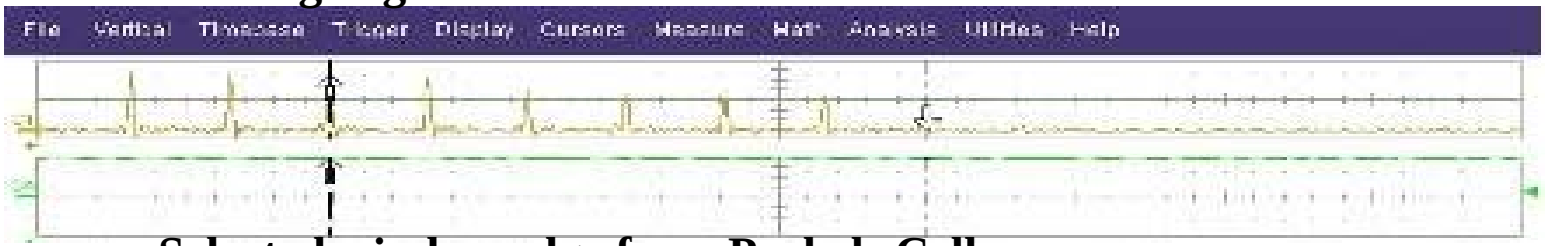
Macro pulse window selection by Pockels Cell



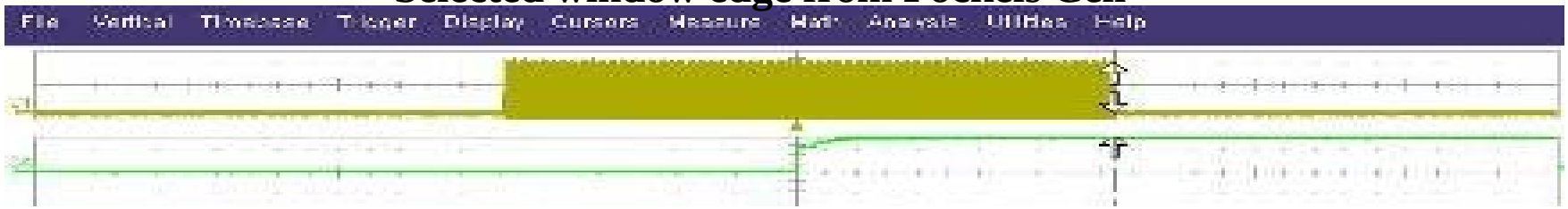
Leading edge from Pockels Cell



Trailing edge from Pockels Cell



Selected window edge from Pockels Cell

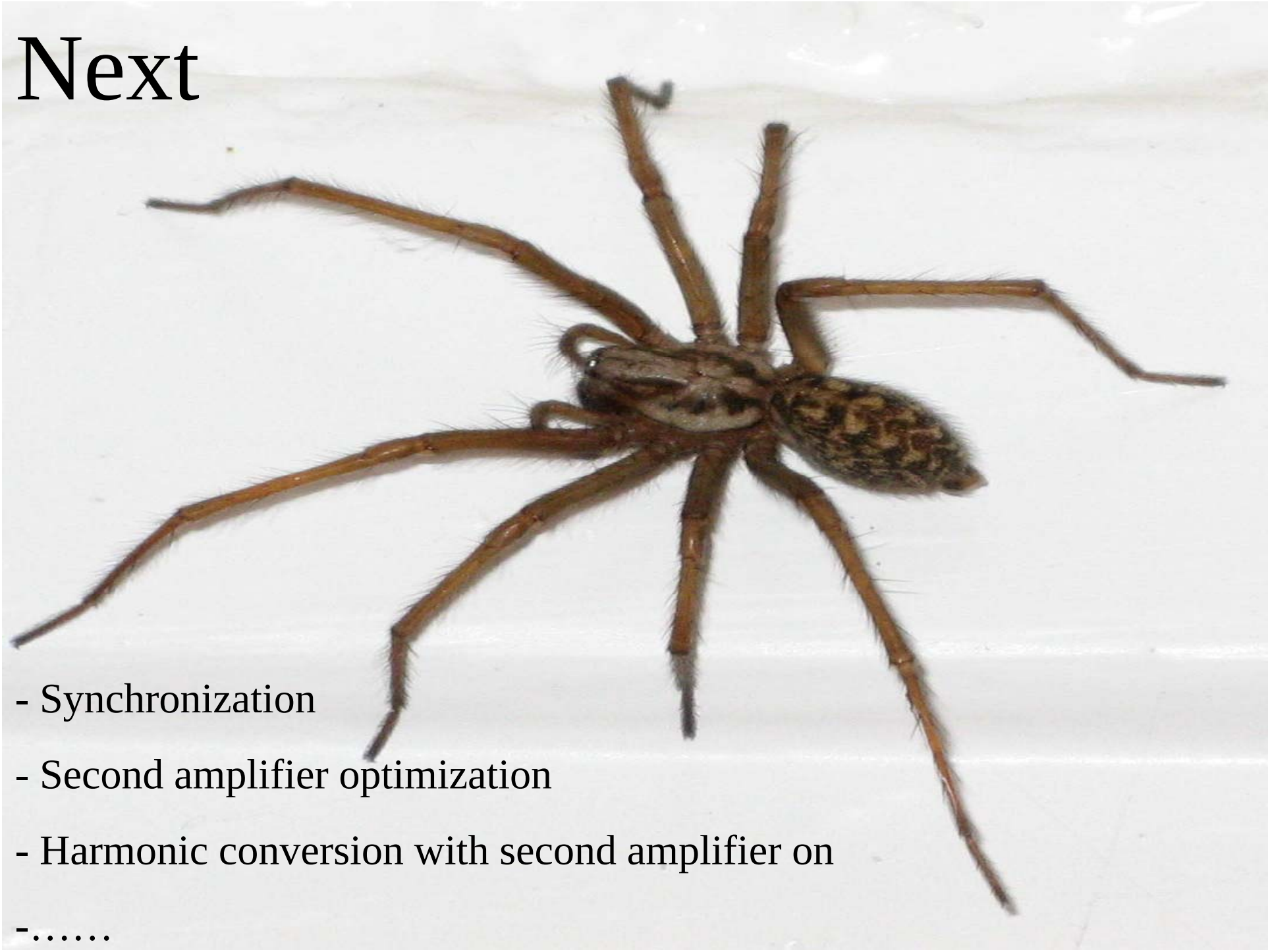


Amp1 Harmonic Generation

	IR energy within 2μs gate	GREEN energy within 2μs gate	UV Energy within 2μs gate
Amp1 @80amps PC on 2μs (Best Result)	(3.97-1.3)mJ std=0.02mJ	1.170 mJ Std=0.16mJ	0.398 mJ Std=0.012 →133.3 nJ in a micro pulse
		~44 % efficiency	~34 % efficiency
Amp1 @80amps PC on 2μs	(4.15-1.33)mJ std=0.06mJ	1.15 mJ Std=0.05mJ	0.375 mJ Std=0.02 →123.3 nJ in a micro pulse

Satisfactory conversion efficiency values has been achieved either for SHG and FHG obtaining a final micro pulse energy of ~120 nJ with only AMP1 working at 80amps

Next



- Synchronization
- Second amplifier optimization
- Harmonic conversion with second amplifier on
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