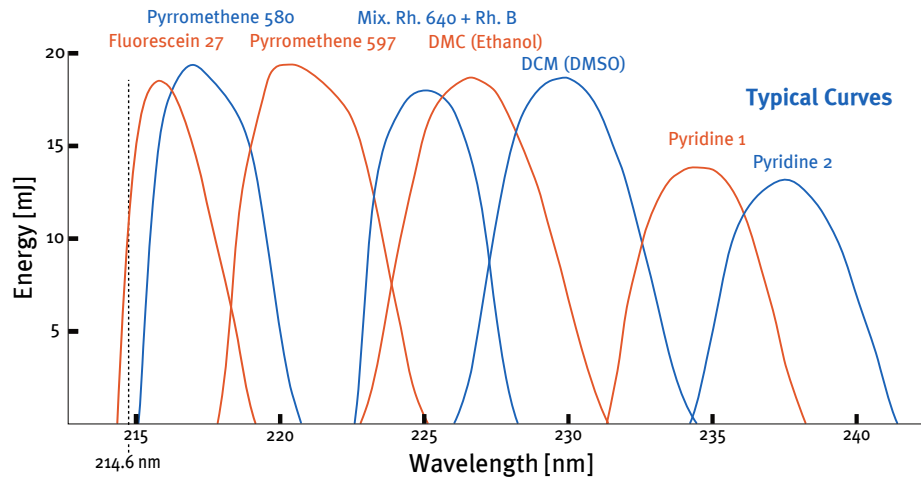


Sum Frequency Mixing with 355 nm

The SFM-355 mixing unit is designed to generate laser radiation in the UV wavelength range, from 214.6 nm to 241 nm. It is operated together with a Cobra-Stretch or PrecisionScan dye laser, ideally pumped by an injection seeded frequency doubled Nd:YAG laser. Generation of wavelengths around 220 nm by mixing is an alternative to the use of frequency doubled (SHG) blue dyes pumped by the frequency tripled YAG. The advantage of this approach is the superior lifetime of the used

dyes and the smaller spectral bandwidth of the generated UV radiation, in case a seeded Nd:YAG laser is used. Although the SFM set-up is more complex, the versatile design permits standard SHG if required. The dye laser is operated in the red spectral range, from 542 nm to 751 nm. Its output beam is sum frequency mixed with the frequency tripled Nd:YAG radiation. Four Pellin-Broca prisms separate the generated UV beam from the dye and Nd:YAG beams.

Tuning Range



Tuning curves with different dyes, when using approximately 600 mJ @ 532 nm for pumping and 300 mJ @ 355 nm for mixing.

Energy Output

Pump Laser Specified Pulse Energy	Mixing Laser Relation Pulse Energy		Output Energy
1250 mJ @ 532 nm	850 mJ @ 532 nm	400 mJ @ 355 nm	32 mJ @ 226 nm
900 mJ @ 532 nm	600 mJ @ 532 nm	300 mJ @ 355 nm	17 mJ @ 226 nm
670 mJ @ 532 nm	450 mJ @ 532 nm	220 mJ @ 355 nm	10 mJ @ 226 nm

General Characteristics

Wavelength Range	214.6-239 nm (with 2400 lines/mm, single grating) 214.6-236 nm (with 2400 lines/mm, double grating) 220-241 nm (with 1800 lines/mm)
Maximum Pump Energy	650 mJ @ 355 nm, 1000 mJ @ 532 nm ¹⁾
SFM Radiation Bandwidth	with seeded Nd:YAG approx. dye laser bandwidth: 0.032 cm ⁻¹ (dual 2400 lines/mm) without seeder approx. Nd:YAG bandwidth: 1 cm ⁻¹
Dye Laser Resonator	2400 lines/mm gratings recommended, 1800 and 3000 lines/mm gratings poss.
Dye Laser Amplifier	enhanced beam profile cell recommended
Repetition Rate	10 Hz recommended
Crystal	BBO, type I, temperature stabilization included
Crystal Tuning Mode	Look-up table (autotracking optional)
UV Beam Polarization	horizontal, > 98 %
UV Beam Diameter	3-6 mm (typical), depending on amplifier cell type
UV Beam Divergence	< 0.5 mrad
SHG Operation Mode	see SHG datasheet for specifications (and contact Sirah)

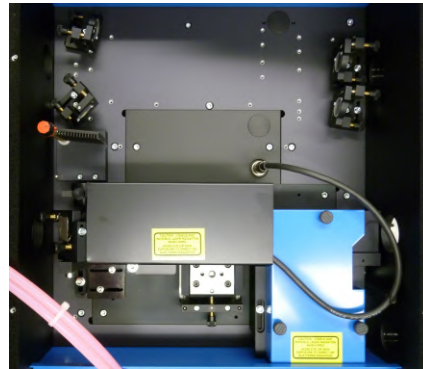
¹⁾ with secondary main amplifier, only possible with PrecisionScan dye laser

SFM 355

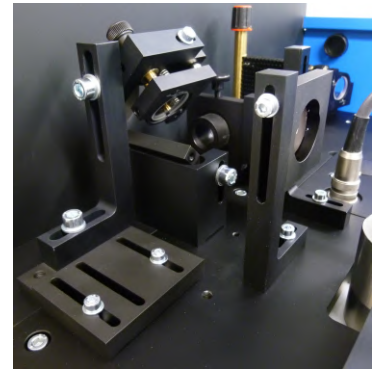
SFM 355 Housing



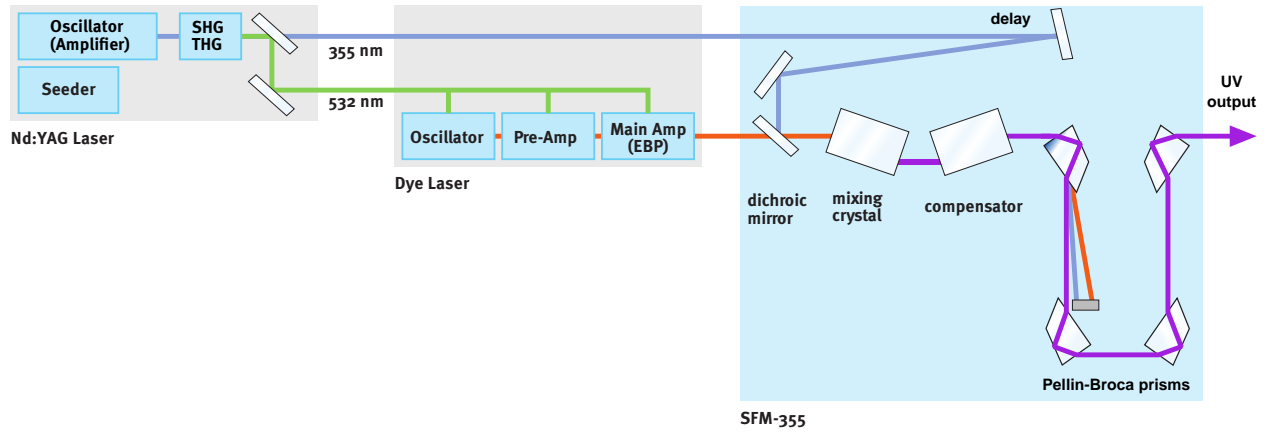
SFM 355 Setup



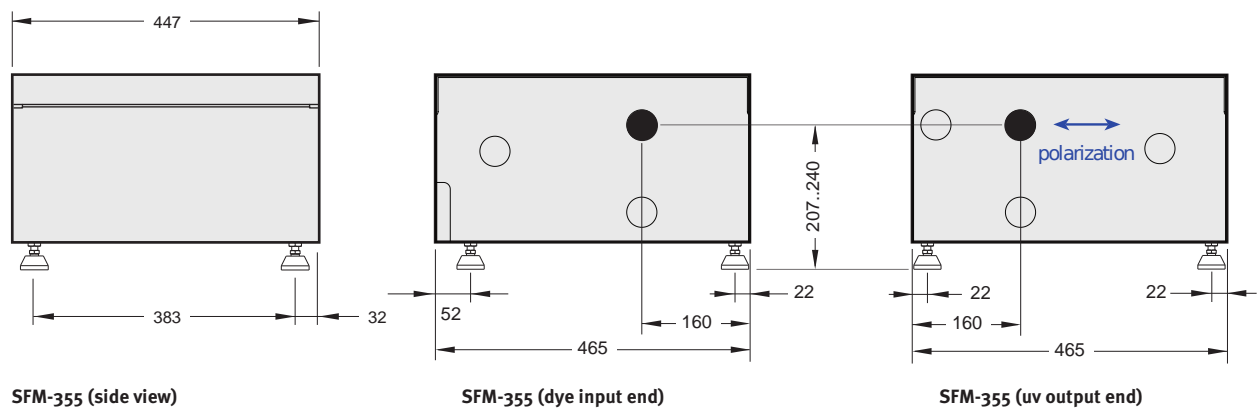
Beam Combining



Optical Layout



Dimensions



All Dimensions in mm
Specifications are subject to change without notice



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