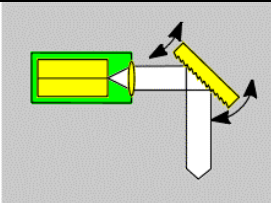
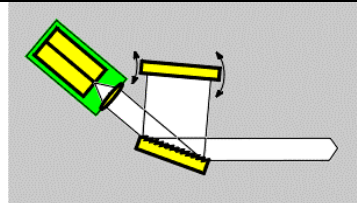


Technical Note – No. 13



Littrow vs. Littman/Metcalf Laser, a comparison

Littrow- and Littman/Metcalf laser are different laser systems. Each type of laser system does have its special advantage, which makes it best suitable for a certain type of application. With this technical note, we are summarizing and comparing the main features of each type of laser system and we hope to give you a guideline for the selection which type of laser will be best suitable for your application.

Feature	Littrow	Littman/Metcalf
		
Output Power	5 ... 100mW	3 ... 30mW
Linewidth (50ms)	1 MHz	300 kHz
Linewidth (20s)	5MHz	2MHz
Fiber Coupling	Yes, with beam correction mirror	Yes
Motor Tuning	Not prepared	Prepared
Active Stabilization / Lockbox	Available	Available

Document: <http://data.sacher-laser.com/techdocs/comparison.pdf>

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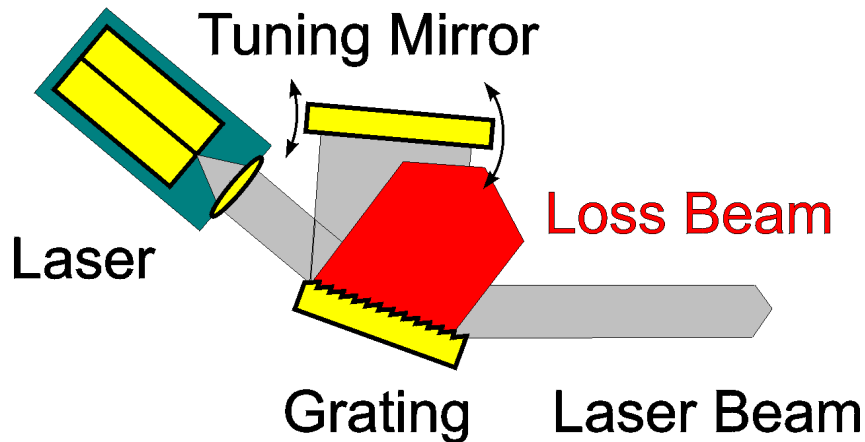
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Why do Littrow Lasers have higher output power than Littman/Metcalf Lasers?



Littman/Metcalf Laser Systems show lower output power than Littrow Laser System, even when using identical diode lasers. This can be explained as follows:

The laser beam is emitted by the diode laser chip, is collimated and then reaches the grating. The grating acts as a beam splitter. The zeroth order beam is coupled out of the laser whereas the first order beam is coupled to the tuning mirror of the laser. There, it is coupled back to the grating. Then, the grating acts again as a beam splitter. The first order beam is coupled back into the laser. However, there appears again a zeroth order beam, which is coupled out of the laser, which is indicated as loss beam in the figure. This light is lost.

This is the reason for the lower output power of Littman/Metcalf Laser Systems in comparison to Littrow Laser Systems. Due to our experience, Littman/Metcalf Laser Systems offer about 50% to 70% of the available output power of a Littrow Laser System.

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