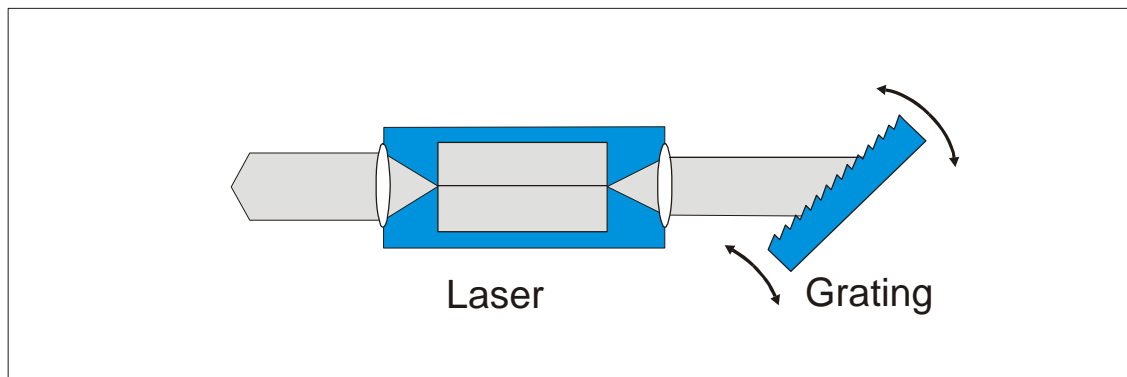


Lynx Series: New Superior Littrow Cavity Design

Sacher Lasertechnik has modified its Littrow cavity design for improving the performance data of the tunable external cavity diode laser (3 patent applications pending).



The new Sacher design was developed for a significant improvement of conventional Littrow laser design as it was published by Ricci et al. We use the back facet of the diode laser chip for coupling the laser light out of the system. By this approach, we are able to design a high quality external cavity. There are no longer compromises required.

1. The strong coupling of the diode to the external cavity results in an excellent repeatability of the laser system, no longer spending half an hour in the morning to get the system back to work.
2. The side mode suppression of the laser system has drastically improved. Typical values go up to 55dB.
3. The total tuning range as well as the mode-hop free tuning range are drastically improved.
4. There is no longer a beam walk when changing the wavelength with adjusting the grating angle.

In summary, the new Sacher design provides a major improvement in the state of the art of designing tunable external cavity diode lasers.

The new Sacher design is currently available for the 780nm .. 795nm, 820nm .. 875nm wavelength range as well as for the 1680nm wavelength regime. Major other wavelength between 730nm and 1710nm will be available during 2004. Please check the availability of your desired wavelength at <http://www.sacher-laser.com/LtwData.php>.

Document: <http://data.sacher-laser.com/techdocs/LynxRedesign.pdf>
Note: Specifications are subject to change without further notice

Sacher Lasertechnik GmbH
Hannah Arendt Str. 3-7
D-35037 Marburg, Germany

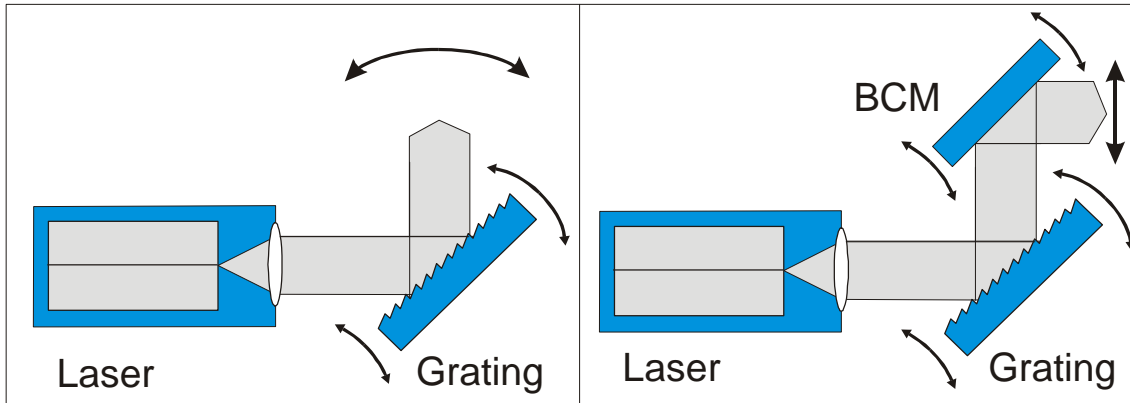
Tel.: +49 6421 305290
Fax: +49 6421 305299
Email: contact@sacher.de

Sacher Lasertechnik, LLC
5765 Equador Way
Buena Park, CA 90620, USA

Tel.: 1-714-670-7605
Fax: 1-714-670-7662
Email: sales@sacher-laser.com



Prior State of the Art:



This design which is commonly known from publications has several drawbacks which we overcome with our redesign:

1. In order to achieve high output power, there is the need for operating the grating in low efficiency mode. In more detail, gratings have a high reflectivity 95% for P-polarized light and a low reflectivity (10%) for the S-polarized light. When using the grating for a high power external cavity diode laser, the result is a poor polarization ratio between TE and TM emission.
2. The weak coupling results in a reduced repeatability on the laser system. E.g. the system was locked to an atomic absorption line. When starting it the next morning, it needs to be tweaked to get back to the line. Therefore, it is not suitable for OEM customers.
3. Application which require a good side mode suppression suffer by a poor side mode suppression in the order of 40dB of this design.
4. A major drawback of this design is the beam walk of the out-coupled laser beam. During a 30 GHz wavelength scan, a parallel shift in the order of up to 10 μ m appears, even with a beam correction mirror attached to the grating. This causes serious problems with the stability of coupling into a single mode fiber or amplification stages. As reference, a typical single mode fiber in the 780nm spectral range has a core diameter of 7 μ m.

Document: <http://data.sacher-laser.com/techdocs/LynxRedesign.pdf>
 Note: Specifications are subject to change without further notice

Sacher Lasertechnik GmbH
 Hannah Arendt Str. 3-7
 D-35037 Marburg, Germany

Tel.: +49 6421 305290
 Fax: +49 6421 305299
 Email: contact@sacher.de

Sacher Lasertechnik, LLC
 5765 Equador Way
 Buena Park, CA 90620, USA

Tel.: 1-714-670-7605
 Fax: 1-714-670-7662
 Email: sales@sacher-laser.com

