

Press Release

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January 15, 2008

iWave series now offers 375 nm

Narrow linewidth diode module now also available at 375 nm

TOPTICA Photonics AG extends the narrow linewidth OEM series by adding a new 375 nm version. These linewidth-reduced laser systems are ideal for Raman microscopy or instruments with linewidth-sensitive optical deflection.

Key specifications include:

- Output power 10 mW at 375 (iWave 375) resp. 50 mW at 405 nm (iWave 405)
- Reduced linewidth, $< 5 \text{ cm}^{-1}$ (150 GHz) $\cong 0.08 \text{ nm}$
- Excellent beam quality, i.e. wavefront error $< 0.05 \lambda$ ($M^2 < 1.2$)
- Beam diameter 1 mm $1/e^2$ (equivalent to gas laser beam diameters)

Many Raman customers examine non-fluorescent samples with high spatial and spectral resolution. Thus they yearn for high power diode lasers with long coherence length / narrow linewidth in the UV-violet spectrum. Previously they were forced to choose between 13 mW at 405 nm with superb coherence length (up to 100 m in an external cavity setup) and 60 mW at short coherence length (a few microns in a free-running diode setup). If these options were not sufficient, the only solution were bulky gas lasers.

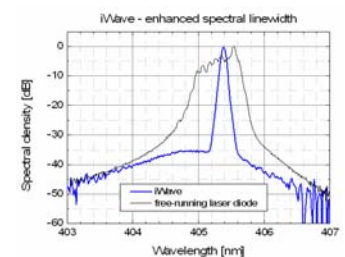
Since 2007, the innovative iWave concept combines excellent power and narrow linewidth (respectively long coherence length). The terms "narrow linewidth" and "long coherence length" both refer to the same laser characteristics: A narrow spectral width corresponds to a long coherence length.

All kinds of non-fluorescent specimen (e.g. in semiconductor industry) can be examined by Raman microscopy with great spatial and spectral resolution.

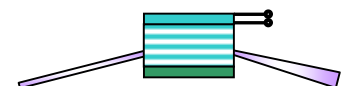
Many non-fluorescent specimens (e.g. in semiconductor industry) can be examined by Raman microscopy with great spatial and spectral resolution. Beyond Raman, many linewidth sensitive optical setups rely on the inherent narrow linewidth of gas lasers. Instruments using acousto-optic deflectors (AOD) prefer a laser with narrow linewidth. Due to the wavelength-



New iWave – hands-off operation for OEM customers



Linewidth of iWave 405, compared to free-running 405 nm laser diode



Linewidth-sensitive optical deflection of AOD

Author:

Bernhard Wondra, TOPTICA Photonics AG

dependent beam deflection, only narrow linewidth lasers achieve smallest nodes and focus diameters. Lasers with broad linewidth generate blurred imaging results.

Typical applications for the iWave series include:

- Raman microscopy of Silicon layers
- Applications with linewidth sensitive deflection (AOD)

The iWave is based on the well established iBeam platform and its matured, rugged design. Benefits for industrial customers are permanent hands-off operation, high beam pointing stability (10 $\mu\text{rad/K}$) and beam quality (TEM_{00} , $M^2 < 1.2$). Hands off control is enabled by the integrated RS 232 interface.

TOPTICA also supports Raman microscopy with NIR diode laser systems, e.g. the XTRA (300 mW at 785 nm, linewidth $< 0.001 \text{ cm}^{-1}$) and the dfBeam (120 mW at 785 nm, linewidth $< 0.002 \text{ cm}^{-1}$).

Now in the UV spectrum, the iWave complements this product family, supporting both existing and new OEM customers. Application notes and detailed description can be found on our website:

http://www.toptica.com/page/industrial_diode_lasers.php

TOPTICA Photonics AG develops, manufactures, services and distributes technology-leading diode and fiber lasers and laser systems for scientific and industrial applications. Sales and service is offered worldwide through TOPTICA Germany and its subsidiary TOPTICA USA, as well as all through 13 distributors. A key point of the company philosophy is the close cooperation between development and research to meet our customers' demanding requirements for sophisticated customized system solutions and their subsequent commercialization.

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