ePulse: Laser Measurement News

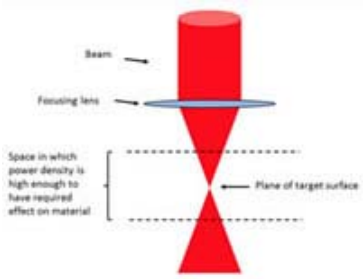
December 2020

Welcome to **ePulse: Laser Measurement News**, a review of new developments in laser beam measurements, beam diagnostics, and beam profiling. Each issue contains industry news, product information, and technical tips to help you solve challenging laser measurement and spectral analysis requirements. Please forward to interested colleagues or have them subscribe.

Features

Measuring High Power Lasers

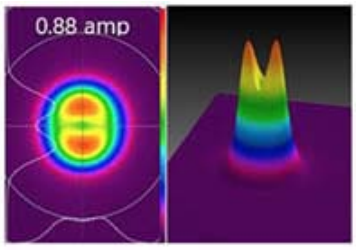
By Mark Slutzki, Product Manager, Ophir



High-power laser beams deliver a lot of power into a small and precisely controlled space. This help us manufacture components that would have been difficult - if not impossible - using purely mechanical means, such as automotive and aircraft manufacture, shipbuilding, and similar heavy-industry applications. But they present challenges, especially when it comes to measurement: cooling, backscatter, use in industrial environments, increasing powers, and more. High Power Lasers.

Measuring Challenges of Wide and Divergent Beams

By Yoni Groisman, Karol Sanilevitch, Roei Yiftah, Dr. Simon Rankel, Ophir

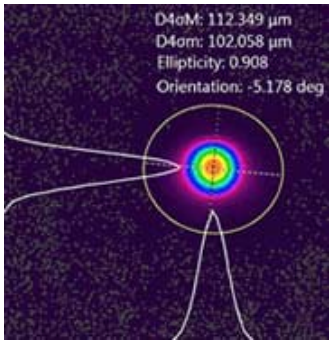


VCSELs, LEDs, edge emitting, and fiber lasers are used in many sensitive applications within fast-growing markets. To guarantee the high quality of the devices, it is essential to analyze the beam profile, but those wide, divergent beams place specific requirements on the measurement system. Wide and Divergent Beams.

Applications

Beam Management in High-Power Directed Energy Laser Projects

By John McCauley, Business Development Manager, Ophir



The development of high-power laser systems for weapon systems presents a unique set of challenges. Lasers that push photons of the magnitude of multiple kilowatts of average or continuous-wave power are more susceptible to thermal effects on their components, as well as increased safety concerns due to risks of eye and skin damage. Additionally, the degradation of components can happen at a faster rate at these higher powers, more quickly resulting in less efficient performance of the system. Here's how to ensure successful missions. Directed Energy Lasers.

Videos of the Month

Ophir Premium Energy Sensors (Even for UV)

Meet Ophir's high performance energy sensors for pulsed UV lasers (and not only for UV). These sensors are the perfect solution for pulsed lasers at 193nm and 248nm. They offer absolute calibration and high damage threshold, even in the UV range. Video: Energy Sensors.

Focal Shift

Is your laser's focus spot where you think it is? This video shows the focal shift of a 100KW laser during the first four seconds of startup using Ophir BeamWatch, the non-contact high power beam analyzer. Video: Focal Shift.

Laser Puzzle

Try your hand at this month's Laser Puzzle. This month we're facing a measurement challenge. At least we're accompanied by some fine wine. Without a measuring device, how do you tell if the wine barrel is more than half empty or half full?

All submissions will receive an 8GB USB pen drive. The grand prize winner will receive a 16GB iPad. E-mail answers to sales.ophir.usa@mksinst.com. Need a hint? E-mail john@enigmaturge.com.

Here's the answer to last issue's puzzle.

Social Media: Blog

Meet Our New Laser Beam Profile Finder

Choosing the right beam profiler can get complicated. You have to

Fiber Optics
There is often confusion when dealing with beams emerging from a fiber. The geometry is a bit different as we have a diverging beam coming out of a small aperture. The parameters usually used to specify a standard laser beam power measurement (such as diameter) are not used in the same way here, and other parameters are often specified (such as Numerical Aperture, core diameter) that are not relevant to standard measurement situations. Here's what you need to know for measuring beams coming out of a fiber. Fiber Optics.

IR Zoom Lenses for Long-Range Security and Surveillance
In the security and surveillance markets, long range, infrared (IR) imaging plays an increasingly important role for monitoring, tracking, and targeting. IR cameras must be equipped with high performance IR lenses that can effectively capture the emitted IR radiation and focus it onto a detector array. IR Zoom Lenses.

Three Tips to Protect Your BeamSquared Device
The Ophir BeamSquared system automatically measures the propagation characteristics of CW and pulsed lasers. Here are three tips to protect your device. Tech Tips.

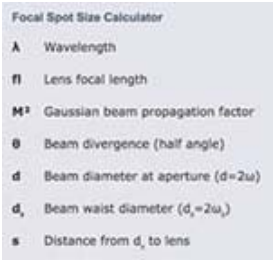
Research News

Monolithic Focus-Tunable Lens Technology
A monolithic focus-tunable lens structure is constructed based on the dielectric-elastomer actuator (DEA) technology incorporating a soft lens and radial in-plane actuator mimicking the ocular focal-tuning mechanism. The focal tuning-range test is based on data collected from a USB CCD-based beam-profiling camera, the Ophir SP620U. Focus-Tunable Lens.

Femtosecond Laser Writing in YAG Crystal
Longitudinal inhomogeneity of tracks inscribed in a YAG crystal and the statistics of nonlinear transmittance of the writing beam are studied under conditions of direct femtosecond laser writing in non-thermal mode. The energy of the laser pulse was measured with an Ophir PD10-C laser sensor. Laser Writing.

What's New

Focus Spot Size Calculator
It is not uncommon in working with lasers to need to focus the laser beam down. There are matrix methods that can be used for propagating the diameter and curvature of the beam, but if your main interest is the location of the new focus (i.e. beam waist) or the size of the focal spot, you can use the Focal Spot Size Calculator tool on the Ophir website.



SupIR 50-1350mm f/5.5 Zoom Lens Wins Gold Innovators Award
We are honored to have received the Gold Innovators Award from *Laser Focus World* magazine for the SupIR 50-1350mm f/5.5, an ultra-long MWIR zoom lens for advanced thermal imaging applications. Gold Innovators Award.

Video: Enabling Technologies that Transform Our World
Cutting edge science and engineering are starting points for the MKS Instrument companies. Equally important in the battle to help our customers succeed is how we listen, collaborate, and solve the hardest technology challenges together. See how we have helped customers to solve complex technology. MKS Instruments.

Technical Tips

Do you sometimes find that you've logged power data, but notice in the decide on a camera type, an attenuator model, maybe a beam expander or beam reducer, and you have to fit all of these together so they will work with each other. You may have a converging beam and want to measure the focal spot or a diverging beam and have to know how to handle that. Our new Beam Profile Finder does all of this for you in three easy steps. Try it out.

Choosing the Right Photodiode Power Sensor
The main advantage of photodiode sensors over thermal power sensors is their fast response time and ability to measure very low powers without thermal noise. There are three categories of photodiode power sensors: standard photodiodes, integrating spheres, and special photodiodes. Let's take a look at each.

Catalogs: Power Meters, Beam Profiling, IR Optics

Download the Q3 2020 Ophir Laser Measurement Catalogs today. Includes tutorials and product specifications for power meters and beam profiling.

The Ophir IR Optics Thermal Imaging Lenses Catalog 2020 covers IR components and complex lens assemblies with fixed or motorized focus and zoom lenses.

MKS Newsletters

TECHinnovations Newsletter for the latest on vacuum, power solutions, gas delivery and analysis, plasma generation, and ozone solutions for semiconductor and advanced markets from MKS Instruments.

Focus on Photonics Newsletter for innovations in lasers, opto-mechanical components, vibration and motion control, and laser characterization from Newport Corp.

Fast Ship Program

Ophir's Fast Ship program provides one-day shipment of the most popular power/energy, beam profiling, and M2 laser measurement equipment across the U.S.

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file a gap of a second or two in which there is no data? Read the Tech Tip.

FAQs

Power Meters
What is the maximum number of sensors that can be connected via USB to one PC? Read the FAQ.

I need a small sensor to measure power of a visible LED. What sensor should I use - will the PD300 work? Read the FAQ.

Beam Profiling
What is the purpose of the Certificate of Calibration and the Certificate of Performance with the Pyrocam IIIHR and Pyrocam IV? Read the FAQ.

I just received my new beam profiler, but it will not power up. Do I need to use the included wall power supplies? Read the FAQ.

I just installed my new beam profiler, but when I open the software, I get a message stating "Console Service not found." What is this and why won't my software find my beam profiler? Read the FAQ.

Web
www.ophiropt.com/photonics

About Ophir

Ophir is a brand within the MKS Instruments Light & Motion division. The Ophir product portfolio consists of laser and LED measurement products, including laser power and energy meters, laser beam profilers measuring femto-watt to hundred-kilowatt lasers, high-performance IR and visible optical elements, IR thermal imaging lenses and zoom lenses for defense and commercial applications, and OEM and replacement high-quality optics and sub-assemblies for CO_2 and high-power fiber laser material processing applications. Dedicated to continuous innovation in laser measurement, the product portfolio includes the **R&D 100** award-winning **BeamTrack** power/position/size meters and Spiricon **Ultracal™**, the baseline correction algorithm that helped establish the ISO 11146-3 standard for beam measurement accuracy. The company is **ISO/IEC 17025:2005** accredited for calibration of laser measurement instruments. The company's modular, customizable solutions serve semiconductor, industrial, life and health sciences, research, and defense industries throughout the world. An ISO 9001:2008 Registered Company.

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