Press Release

FBH presents new diode laser and UV LED developments at the Photonics Days

From October 4 - 7, 2021, the Photonics Days Berlin Brandenburg will be held in hybrid format. The Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) will participate with talks and in the two-day exhibition on October 6-7 in Berlin-Adlershof.

Berlin, 27.09.2021

The four-day conference brings together experts from photonics, optics, microsystems technology, and quantum technology. Scientists from the Ferdinand-Braun-Institut present latest results on high-power diode lasers, UV LEDs including the corresponding irradiation systems for medical applications, and quantum technologies. At the booth, FBH will show a diode laser stack optimized for high output powers and a UVC LED irradiation system for medical studies. Moreover, an exhibit exemplifying the application of yellow-green laser modules in ophthalmology will be displayed for the first time. FBH is developing the directly tunable laser sources in the wavelength range from 532 nm to 561 nm to 590 nm with up to 2 watts output power in continuous wave operation. The compact laser sources have the potential to replace significantly larger dye and copper bromide lasers.

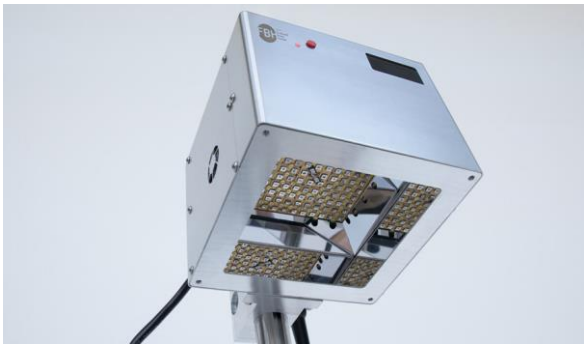
LED irradiation systems to fight multidrug-resistant pathogens and coronaviruses

FBH has developed UV LED-based irradiation systems, which are already being tested at the Charité, Universitätsmedizin Berlin and at the Greifswald University Hospital. In the future, this irradiation concept will be used to inactivate multidrug-resistant pathogens such as MRSA and coronaviruses including SARS-CoV-2 directly on humans in a way that does not harm the skin. Each system is equipped with 120 LEDs that emit at 233 nm wavelength, developed jointly with TU Berlin. Thanks to optimized semiconductor epitaxy and chip process technology, these latest-generation LEDs can be operated with twice the current as before – they deliver more than 3 mW output power at 200 mA. Furthermore, FBH has developed new silicon-based LED packages in collaboration with the CiS Forschungsinstitut für Mikrosensorik. In addition to efficient heat dissipation, aluminum reflectors and a plano-convex lens ensure a beam angle of only 60 degrees. This, in turn, increases the transmission, i.e. the light that the integrated spectral filter allows to pass through. The systems can irradiate an area of 70 mm diameter with a homogeneity of more than 90 %. The UVC light is free of skin-damaging wavelengths above 240 nm and has an irradiance of 0.4 mW/cm^2 – ten times more than previous systems achieved.

More details: Session on 7.10. (in presence) "Advanced UV technologies & applications".

Record values for diode lasers – optimized for high output powers

FBH will also present its advances in high repetition rate pump lasers for future high-energy class solid-state laser systems. The institute was able to increase the peak output power of its diode laser bars in quasi-continuous operation by up to four times while maintaining excellent efficiency. This reduces the cost in euros per watt – a key parameter for industry. FBH builds the optimized diode lasers into stack modules, with improvements in packaging and optics. For example, a fiber-coupled pulsed pump laser source with 1 kW output power at 780 nm wavelength was demonstrated for the first time in a 1 mm core fiber (previously 1.9 mm). The passively cooled module was able to increase the duty cycle from 20 % to up to 50 % (10 ms 10...50 Hz).



The press pictures are available here for download. All images are copyrighted.

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About the FBH

Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) researches electronic and optical components, modules and systems based on compound semiconductors. These devices are key enablers that address the needs of today's society in fields like communications, energy, health, and mobility. Specifically, FBH develops light sources from the visible to the ultra-violet spectral range: high-power diode lasers with excellent beam quality, UV light sources and hybrid laser systems. Applications range from medical technology, high-precision metrology, and sensors to optical communications in space and integrated quantum technology. In the field of microwaves, FBH develops high-efficiency multi-functional power amplifiers, and millimeter wave frontends targeting energy-efficient mobile communications as well as car safety systems. The FBH has a strong international reputation and ensures rapid transfer of technology by working closely with partners in industry and research. The institute has a staff of 350 employees and a budget of 39.1 million euros. It is a member of the Leibniz Association and part of »Research Fab Microelectronics Germany«

www.fbh-berlin.de/en