



University of Central Florida

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Laser Arrays that are Faster, Flexible and Efficient

New Pump Cavity Design Adds Stability and Efficiency

UCF researchers have developed a method of rapidly changing a pump source in a laser system that provides flexibility and saves valuable time. When modifying the laser array, this new design allows for rapidly adapting the laser to changes in temperature in any environment. The design increases stability and reliability during mechanism shifts necessary for peak efficiency, which can be automated by a sensor, preserving delicate resonator alignment and cutting downtime. From single watts to hundreds of watts of output, this pump cavity design functions over a wide range of output powers. You can now use this simple pump cavity to replace currently-marketed complex diode pumped laser designs at a reduced price and with convenient configurations, boosting your laser's efficiency to as high as 81%.

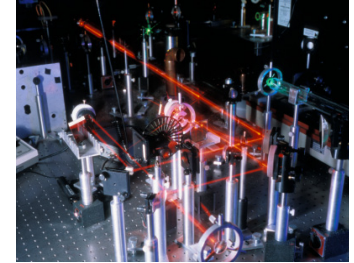
Technical Details

Pump cavities in lasers collect light from the pump source and deliver it to the gain medium where it is absorbed to power the laser. While diode lasers are excellent pump sources, the light can diverge and be hard to get into the gain medium. Old designs had reflecting surfaces which were either specular, providing high pump efficiency but poor uniformity, or scattering, providing good uniformity but low pump efficiency. The patented new design optimizes light behavior with a house shaped cross section called a roof top cavity, which employs a mixture of specular and scattering surfaces to achieve both uniform pumping and efficiency, improving the function of your laser. Previous pump cavity designs required re-alignment of the solid state laser resonator when the diode laser array needed to be altered, costing substantial time. This new pump cavity works with commercially-available diode laser arrays and can be configured to automate the rapid interchangeability of the pump source.

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Inventors

Michael Bass Ph.D.; Ying Chen



Benefits

- Automates rapid change of the diode laser array pump source
- Boosts laser uniformity and efficiency
- Works in any environment
- Operates over a range of temperatures
- Functions over a range of output powers
- Minimize downtime

Applications

- Commercial lasers
- Military lasers used in the field for designation and ranging

Tech Fields

Optics & Lasers, Defense

Keywords

solid state laser operation, diode laser array, pump cavity

If you or your company are interested in this opportunity, Contact:

John Miner | P 407.882.1136 | E John.Miner@ucf.edu | Tech ID# 32018

UCF Office of Technology Transfer | 12201 Research Parkway, Suite 501, Orlando, FL 32826