

Frequency-Narrowed High-Power Diode Laser System with External Cavity



INVENTORS • Thad Walker, Bien Chann, Ian Nelson

WARF: P00036US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method and device for producing a very narrow spectrum from a high-power diode laser array.

OVERVIEW

An important proven use for high-power diode lasers is to produce laser-polarized gas for magnetic resonance imaging applications. Currently, high power diode laser array systems put out only a fraction of the desired wavelength. For example, a 15-watt diode array may only put out one or two watts of usable power.

THE INVENTION

UW-Madison researchers have developed a high-power diode laser array system that uses an external cavity to narrow the spectral width, changing the output power from a broad spectrum to a very narrow spectrum. The light from each emitter is collimated, reflected off a diffraction grating and imaged back onto the emitter. This causes each diode to preferentially lase at the wavelength that is fed back. The result is a diode laser array that uses a much greater portion of the laser's output power.

APPLICATIONS

- Production of laser-polarized gas for MRI or industrial applications

KEY BENEFITS

- Provides a high power diode laser modified to produce a very narrow spectrum of output power, rather than the broad spectrum normally produced
- A 2.5-watt diode laser can be modified so that it is more efficient and considerably less expensive than a 15-watt diode laser.
- An array of three to four, frequency-narrowed, four-watt lasers can replace the 100 watt diode arrays currently used for industrial production of polarized noble gases, significantly reducing costs.

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



- This system lets the user adjust and set the level of feedback, which allows maximum tunability, maximum output power and a combination of tunability and output power.

ADDITIONAL INFORMATION

Tech Fields

Medical Imaging - MRI

Analytical Instrumentation - Lasers

CONTACT INFORMATION

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842.

