

# Scalable concept for diode pumped high power solid state lasers

How do diode-pumped high-power solid-state lasers work?

A new,scalable concept for diode-pumped high-power solid-state lasers is presented. The basic idea of our approach is a very thin laser crystal disc with one face mounted on a heat sink. This allows very high pump power densities without high temperature rises within the crystal.

Is a diode pumped system scalable?

Abstract. A new, scalable concept for diode-pumped than the traditional Nd-doped systems. Theefficient high-power solid-state lasers is presented. Thebasic idea room temperature operation of an InGaAs diode-pumped of our approach is very a thin laser crystal disc with one Yb:YAG laser with output an ower of24 mW wasfirst face mounted ona heat sink.

Can a diode pumped solid-state laser be used in a kilowatt range?

Compact diode-pumped solid-state lasers in the kilowatt range seem to be possibleby increasing the pump-beam diameter and/or by using several crystal discs. P. Lacovara,C.A. Wang,H.K. Choi,R.L. Aggarwal,T.Y. Fan: In Proc. Conf. on Lasers and Electro-Optics.

Do diode pumped Nd lasers reduce thermal load?

Thermal loading decreases significantlywhen diode-pumped Nd lasers are compared with flashlamp-pumped Nd lasers,but the thermal load is still not insignificant. In fact,significant thermal lensing effects have been measured in high-power diode-laser pumped Nd lasers .

Why is a single fiber a good choice for a diode pumped laser?

A single fiber to carry all the power,as opposed to a fiber bundle,is desirable because it is less bulky and it maintains a greater degree of pump-beam brightness,which allows improved performance from diode-pumped lasers . as the active ion in the solid state gain medium with output near 1.06 or 1.32  $\mu\text{m}$ .

Who invented a diode pumped laser?

Lincoln Laboratoryhas participated in the development ofthese lasers since the beginning; the first diode-pumped laser was a  $\text{U}^{3+}:\text{CaF}_2$  laser demonstrated at Lincoln Laboratory by R.J. Keyes and T.M. Quistin 1964 . Figure 1 shows a diagram of this device.

Solid-state lasers are attractive sources of coherent radiation for various scientific and technological applications. But the different fields of applications increasingly demand ...

Modeling and CW operation of a quasi-three-level 946 nm Nd: YAG laser. IEEE Journal of Quantum Electronics, 1987 Scroll to top

The self-repairing nature overcomes the issue of the burning of holes occurring in solid-state media due to the

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high power of narrow-line emitted light beams. The liquid host ...

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Giesen, A., Huegel, H., Voss, A., Wittig, K., Brauch, U., & Opower, H. (1994). Scalable concept for diode-pumped high-power solid-state lasers.

the thin disk laser [3], high average powers became possible in a power-scalable concept with excellent beam quality, the latter being a requirement for stable passive mode ...

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A brief review of the advances in diode-pumped, Neodymium-doped, high-efficiency lasers is presented, showing how different configurations were able to achieve ...

Scalable Concept for Diode-Pumped High-Power Solid-State Lasers Ingenta 0 : 114 : Giesen, A., Huegel, H., Vost, A., Wittig, K. : 1994 ...

higher radiance than the diode lasers. The solid state laser can produce higher peak power than the diode laser pump source. Diode lasers are peak-power-limited devices; ...

A multi-pass pumping scheme for thin disk lasers with good anti-disturbance ability Yan Huang, 1,2 Xiao Zhu, 1,2,\* Guangzhi Zhu, Jianli Shang, Hailin Wang, 1,2 Lijun Qi, ...

The physics, design principles, and implementing technologies of quasi three level (Q3L) diode pumped solid state lasers (DPSSLs) are outlined, using Yb:YAG as the defining example. ...

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Scalable concept for diode-pumped high-power solid-state lasers. A. Giesen H. Huegel A. Voss K. Wittig U. Brauch H. Opower. Physics, Engineering. 1994; A new, scalable concept for diode ...

Scalable Concept for Diode-Pumped High-Power Solid-State Lasers A. Giesen 1, H. Huegel, A. Voss 1, K. Wittig 1, U. Brauch 2, H. Opower 2 ... Abstract. A new, scalable ...

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A concept for a multi-100 W Yb:YAG laser, utilizing very thin crystal discs to allow high pump-power densities without efficiency reduction or thermal distortion, is presented.

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The new, scalable thin disc laser concept allows efficient diode-pumped high-power operation of solid state lasers with high beam quality. This concept is very useful to operate quasi-three ...

We have demonstrated three novel lasers based on this technology. The first is a zig-zag slab laser pumped by hybrid planar microchannel-cooled diode arrays that allow high ...

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