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Tailored bar concept for 10 mm-mrad fiber coupled modules suitable to kW-class direct diode lasers

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#### ABSTRACT

In this paper, bar modules based on newly developed tailored bars are presented. The modules allow efficient fiber coupling of more than 320 W into 10 mm-mrad or 160 W into 6 mm-mrad at one single wavelength. The tailored bars enable power scaling concepts which enable kW-class lasers with a beam quality of 10 mm-mrad.

**Keywords:** Fiber coupled laser, Direct diode laser, Tailored bar, Coupling

#### 1. INTRODUCTION

Direct diode laser bars are extensively employed in the kW-class range for a variety of industrial and scientific applications. The main reason for this is the high power density and the high efficiency of these devices. However, the high power density and the high efficiency of these devices are also the main reason for the high thermal load of these devices. This leads to a high thermal load of the device and a high thermal load of the device. This leads to a high thermal load of the device and a high thermal load of the device.

#### 2. MODULE-LASER CONCEPT

The main idea of the module concept is to integrate several tailored bars into one single module. This leads to a high power density and a high efficiency of the device. This leads to a high power density and a high efficiency of the device. This leads to a high power density and a high efficiency of the device.

## Tailored Bar Concepts for 10 mm-mrad Fiber Coupled Modules Scalable to kW-class Direct Diode Lasers

Laser modules based on newly developed tailored bars are presented. The modules allow efficient fiber coupling of more than 320 W into 10 mm-mrad or 160 W into 6 mm-mrad at one single wavelength. For further power scaling dense wavelength coupling concepts are presented which enable kW-class lasers with a beam quality of 10 mm-mrad.

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