

TUoC: High-Power Fiber Lasers

Chaired by Jose Salcedo, Multiwave Photonics, Maia, Portugal

Time: Tuesday 14:15–16:15

Location: Amphi A

Keynote

TUoC.1 Tue 14:15

Power Scaling Fiber Amplifiers: Challenges and Opportunities — ●MICHEL DIGONNET — Stanford University, Stanford, CA 94305, USA

We will review the innovations that have led to the development of multi-kilowatt Yb-doped fiber amplifiers, and discuss potential solutions to the challenges of further scaling their power while maintaining a single-transverse-mode, single-frequency output with a stable polarization.

TUoC.2 Tue 15:00

45 W 980 nm single transverse mode Yb-doped fiber laser — ●FABIAN RÖSER, DAMIAN SCHIMPF, CESAR JAUREGUI, JENS LIMPET, and ANDREAS TÜNNERMANN — Institute of Applied Physics, University of Jena, Jena, Germany

We report on the generation of 45W output power in the 980nm wavelength region from an Yb-doped fiber laser. This is achieved using a rod-type photonic crystal fiber in a laser configuration pumped at 915nm. To our knowledge this is the highest output power achieved in this wavelength range.

TUoC.3 Tue 15:15

High power tapered ytterbium fiber laser pumped by low brightness source — ●VALERY FILIPPOV¹, YURI CHAMOROVSKI², JUHO KERTTULA¹, ARTEM KHOLODKOV², and OLEG OKHOTNIKOV¹ — ¹Optoelectronics Research Centre, Tampere University of Technology, 33101 Tampere, Finland — ²Institute of Radio and Electronics of the Russian Academy of Sciences, Mokhovaya 11, bld.7, 125009 Moscow, Russia

Tapered double clad all-glass ytterbium fiber laser with a maximum output power over 200 W at 1079 nm and slope efficiency over 70% was demonstrated. The tapered double clad fiber as a gain medium combines improved pump absorption and firm fundamental mode operation with M²*1.02 with strong potential for significant power scaling.

TUoC.4 Tue 15:30

High power tunable Er,Yb ribbon fibre laser — ●J. W. KIM, A. J. BOYLAND, A. S. WEBB, J. K. SAHU, and W. A. CLARKSON — Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, UK

We report a high power Er,Yb double-clad ribbon fibre laser pumped by a multi-bar pump module. The laser yielded 102W of output power at 1566nm for 244 W of launched pump power. Tunable operation over 34nm was also demonstrated.

TUoC.5 Tue 15:45

High-power linearly-polarised Yb fibre laser and tunable Er,Yb fibre laser using Volume Bragg Gratings for wavelength selection — ●PU WANG¹, PAR JELGER², JI WON KIM¹, JAYANTA SOHU¹, FREDRIK LAURELL², and ANDY CLARKSON¹ — ¹Optoelectronics Research Centre, University of Southampton, Southampton SO17 1BJ, UK — ²Department of Applied Physics, Royal Institute of Technology (KTH), Roslagstullbacken 2, 10691 Stockholm, Sweden

High power operation of Yb and Er,Yb fibre lasers employing Volume Bragg Gratings for wavelength selection is reported. The Yb-laser generated 138 W of linearly-polarised single-mode output at 1066 nm. The Er,Yb laser yielded 103 W of output at 1553 nm and 30-38 W of tunable output at 1528~1552 nm.

TUoC.6 Tue 16:00

Widely-tuneable Tm-doped fibre master-oscillator power-amplifier with >100 W output power — ●LEE PEARSON, DEYUAN SHEN, JAYANTA SAHU, and WILLIAM A. CLARKSON — Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, UK.

We report a Tm-doped silica-fibre master-oscillator power-amplifier with >100W of linearly-polarised continuous-wave output and 1820-2010nm tuning range. A novel amplifier fibre geometry was employed to prevent fed back to the master-oscillator without the need for an isolator. Further power-scaling in cw and pulsed (gain-switched) modes of operation are considered.