



Actively controlled and fully integrated short-pulsed chip lasers

BACKGROUND

The generation of short laser pulses is typically accomplished by inserting an acousto-optic or electro-optic modulator into a bulk-optical resonator to realise q-switched and/or cavity-dumped operation.

However, these devices are rather large, need active cooling and require either radio-frequency voltage (RF) or high voltage (HV) power supplies, all of which make them expensive and unsuitable for use in compact field-transportable systems.

OUR SOLUTION

We propose combining a patented waveguide chip laser technology suitable for pulsed operation (jointly held by Macquarie University and University of Adelaide) with a patented optical transducing technology that has recently been developed in the context of next-generation optical sensor networks by Zedelef Pty Ltd.

Those novel transducers can be utilised to act as fast, miniaturised and electronically controllable output couplers in waveguide lasers and can thus be used to implement q-switching and/or cavity dumping in those lasers. Moreover, the miniaturised transducers can be fully integrated onto the laser chips, enabling a fully monolithic and thus inherently compact and robust design.



photo: Martin Ams

APPLICATIONS

Light Detection And Ranging (LIDAR)
Medical diagnostics
Environmental sensing
Optical free-space communication
Marking

INVENTORS

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INTELLECTUAL PROPERTY POSITION

Australian Patent Application:

Voltage-controllable laser output coupler for integrated photonic devices

PUBLICATIONS

C. Wieschendorf, S. Gross, L. Silvestri, F. Ladouceur, D. Spence, A. Fuerbach: "Compact integrated actively Q-switched waveguide laser source on a chip scale", 7th International Conference on Optical, Optoelectronic and Photonic Materials and Applications (ICOOPMA), Montreal, Canada (2016)

WOULD YOU LIKE TO KNOW MORE?

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