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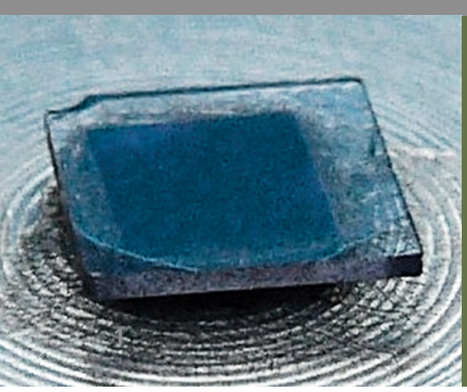

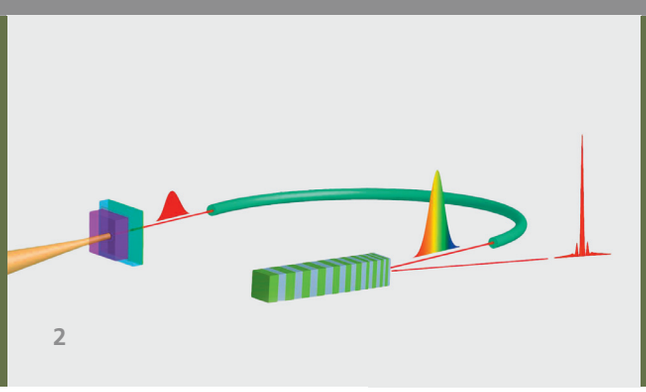

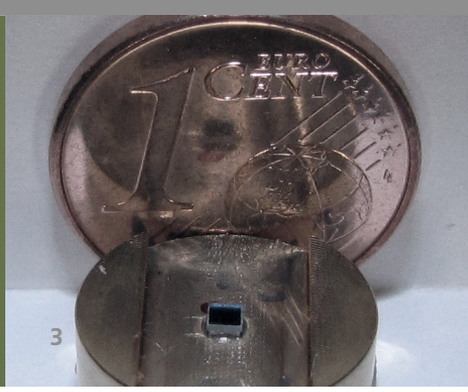


1 *Close-up of a microchip laser.*
2 *Scheme of the pulse compression of microchip laser pulses.*
3 *Comparison of the sizes of a microchip laser and an Euro cent coin.*

# Q-SWITCHED SUB-PICOSECOND MICROCHIP LASER SYSTEM

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## Motivation

The generation of ultra-short laser pulses provides a basis for numerous innovative applications. Mode-locked lasers, however, are the only ones who are able to generate pulses in the sub-picosecond range so far, whose setup is complex and comparatively expensive. More favorable Q-switched lasers that are suitable for industrial use generally emit pulses between 100 picoseconds and several nanoseconds.

## Characteristics

Based on novel packaging techniques of the Fraunhofer IOF, a cost-efficient system with a passive Q-switched microchip laser was developed, whose pulses are shortened to picoseconds in a patented manner. The laser pulses of the system are not mode-locked. The fiber-based method of pulse compression and spectral pulse filtering allows the setup of a stable and compact system, which represents a viable alternative for mode-locked lasers in the industrial environment.

## Application

- Material processing
- Spectroscopy

## Technology

- Passive Q-switched microchip laser as compact laser source
- Fiber based method of pulse compression and spectral pulse filtering

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