

Ultrafast pulsed fiber lasers based on graphene and 2-D-materials

K. M. Abramski

Laser and Fibre Electronics Group, Wroclaw University of Technology, Poland

Thanks to unique optical properties, graphene is considered as a future material for optoelectronics and laser technology. Thanks to its broadband and wavelength independent absorption of light, ultrashort recovery time and third order non-linear susceptibility, graphene is used as a new kind of saturable absorber for ultrashort pulse duration in mode-locked lasers. As a result, optical pulses as short as hundreds of femtoseconds can be generated. The Laser & Fibre Electronics Group of Wroclaw University of Technology carries out research on the application of graphene in lasers. Recently, the group has developed a prototype of an ultrafast, graphene-based fiber laser. After passing a number of rigorous stability tests, the device will be introduced to the market. The extensive research on ultrafast fibre lasers operating at different wavelengths (ranging from 1 μm to 2 μm) with the use of different novel two-dimensional nanomaterials (graphene, topological insulators, transition-metal dichalcogenides) will be presented.