Appl. Phys. B 65, 113 (1997)

Applied Physics B Lasers and Optics

Editorial

The many remarkable advances that have recently been made in ultrashort pulse generation provide sources with pulse durations as short as 6.5 fs directly out of a Ti:sapphire laser and pulse durations as short as 4.5 fs with external pulse compression. This special issue coincides with and acknowledges a benchmark in ultrashort pulse generation: pulses as short as 6 fs were generated 10 years ago with fiber-grating pulse compression of amplified pulses of a colliding-pulse modelocked dye laser. Today, shorter pulses have been demonstrated for the first time since 1987 and the pulse energies are also substantially higher. Solid-state lasers have been playing a leading role in ultrashort pulse generation since 1990. These lasers also open up new possibilities for practical "real-world" ultrafast sources. Therefore, the second part of this issue is devoted to a typical example of a real-world ultrafast laser, i.e. the diode-pumped femtosecond Cr:LiSAF laser, which was modelocked for the first time in 1993. This laser's pulse duration has been reduced to ≈ 20 fs and the average output power has been increased to 500 mW with 100-fs pulses. Another approach for "real-world" ultrafast sources are fiber lasers. Two invited papers provide an overview of the ultrashort pulse performance based on this approach.

Most of the papers in this special issue have been invited to provide a full overview of the state-of-the-art capabilities in ultrashort pulse generation today. I am sure that new discoveries are still ahead of us and will continue to drive the strong world-wide research effort.

I would like to thank all of the authors who have contributed to this special issue. In addition, I would like to acknowledge the expertise and efforts of the referees, who have provided invaluable feedback on all manuscripts.

Ursula Keller