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## Linear optical methods as ultrashort pulse diagnostics

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Experiments with energetic few-cycle laser pulses in most cases require perfect spatial and temporal concentration of the pulse energy. Therefore spatial and temporal compression of ultrashort pulses is one of the key issues of chirped pulse amplification (CPA) systems, the most commonly used method to achieve high intensity laser beams. Even a slight misalignment of grating or prism pairs in the stretcher-compressor systems can lead unwanted spatiotemporal aberrations in ultrashort pulses. Hence, correct shaping of the temporal envelope and recombination of the spectral components of these broadband pulses need careful alignment of the stretcher-compressor stages. Pulse parameters are required to be measured at the target as well. Several diagnostic techniques have been developed so far for the characterization of ultrashort pulses. Some of these methods utilize nonlinear optical processes, while others based on purely linear optics, usually combined with spectrally resolving device. The purpose of this talk is to provide a review on the capabilities and limitations of the latter category of the ultrafast diagnostic methods. We feel that the importance of these powerful, easy-to-align, high-precision techniques needs to be emphasized, since their use could gradually improve the efficiency of different CPA systems. A general description is given on the background of spectrally resolved linear interferometry and various schematic experimental examples are demonstrated for the detection of material dispersion, angular dispersion and carrier-envelope phase drift. Precision estimations and discussion of potential applications are also provided.

## Biography

Adam Borzsonyi has completed his PhD at the University of Szeged, Hungary in 2012, and he is currently employed there as a Postdoctoral fellow at the TeWaTi Laser Laboratory of the Department of Optics and Quantum Electronics. His research area is ultrafast pulse amplification and spatiotemporal diagnostics. He also designs and develops methods, devices and algorithms for pulse characterization at the CE Optics Company. He published 10 journal papers and more than 25 conference contributions. He and his research group are working closely to the soon-to-build attosecond laser facility, the Extreme Light Infrastructure, Attosecond Light Pulse Source (ELI-ALPS) in Hungary.

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