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Autore	Sommer Annkatrin Madlen
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Note generali	"Doctoral Thesis accepted by the Ludwig Maximilian University of Munich, Germany."
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Theoretical Description of the Nonlinear Optical Pulse Propagation -- Time Integrated Investigation of the Nonlinear Kerr Coefcient -- Attosecond Transient Absorption Spectroscopy -- Strong Field Modication of the Reectivity -- Attosecond Polarization Spectroscopy -- Outlook -- Conclusion.
Sommario/riassunto	This thesis presents a systematic discussion of experimental approaches to investigating the nonlinear interaction of ultrashort visible strong fields with dielectrics directly in the time domain. The key finding is the distinctly different peak-intensity dependence of the light-matter energy transfer dynamics on the one hand, and the observed transient optical and electronic modifications on the other. As the induced electron dynamics evolve on sub-femtosecond timescales, real-time spectroscopy requires attosecond temporal resolution. This allows a range of parameters to be identified where the optical properties of the samples exposed to ultrashort light fields suffer

dramatic changes allowing signal metrology while real absorption leading to dissipation is essentially absent. These findings indicate the feasibility of efficient optical switching at frequencies several orders of magnitude faster than current state-of-the-art electronics and thus have far-reaching technological consequences.

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