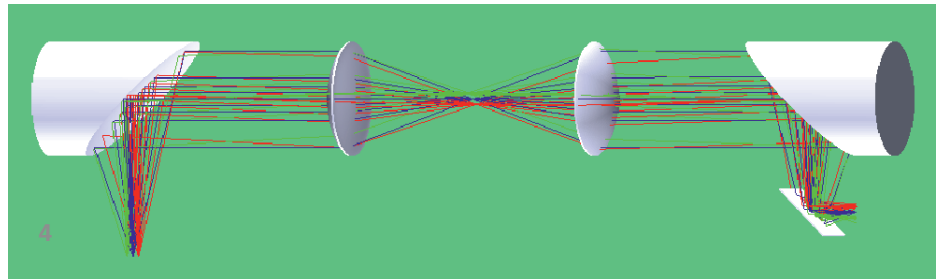


- 1 UP-turned antireflective structure.
- 2 Off-axis parabolic mirror ($d = 76 \text{ mm}$).
- 3 ZEONEX® and PTFE lenses.
- 4 Optical design of a THz system.

DESIGN AND PRODUCTION OF THz OPTICS



Fraunhofer Institute for Applied Optics and Precision Engineering IOF

Albert-Einstein-Straße 7
07745 Jena

Director
Prof. Dr. Andreas Tünnermann

Head of Business Unit Photonic Sensors and Measuring Systems
Prof. Dr. Gunther Notni

Contact
Constanze Pradarutti
Phone +49 3641 807-252
constanze.pradarutti@iof.fraunhofer.de

www.iof.fraunhofer.de

THz-radiation – Design of optical components and systems

Terahertz radiation (wavelength range: $30 \mu\text{m} - 3 \text{ mm}$) has low energy, is non-ionizing, and transmits most plastic materials. Thus, it is of great interest in many fields of metrology and quality management. For the design of THz quasi-optical systems classical raytracing and physical optics propagations tools are applied. Challenging tasks to the optical design are the large wavelength, the broad spectral bandwidth and the available lens materials. The number of lenses in the setups should be as low as possible to avoid absorption losses in the bulk material. Aspherical lenses are fabricated by ultra-precision (UP)

turning. As antireflective treatment of the plastic lenses surfaces shapes like moth-eye structures are used, which are also fabricated by ultra-precision machining.

Our offer

- Design and development of THz-optics and THz-systems
- Design and development of antireflection surfaces
- Manufacturing of THz-optics and antireflection surfaces
- Development and setup of fs-fiber lasers for THz-generation
- Development of THz-emitter and receiver on the basis of semiconductors or electro-optic crystals