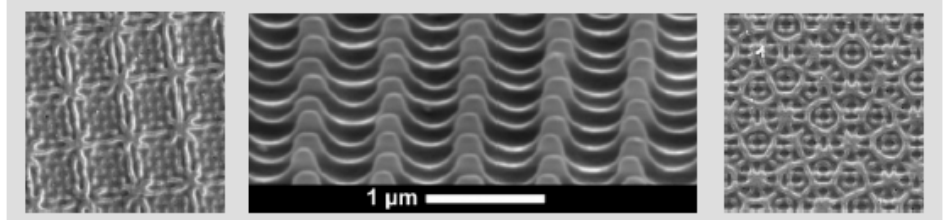


UV - Ultrafast Laser Processing

Ultrafast lasers offer superior materials processing quality. The extremely high precision is due to the short interaction time of the laser pulse with the irradiated zone of the workpiece, this way minimizing the heat transport to the surrounding volume thus avoiding damage or melting. Obviously, the spatial resolution of the sample irradiation scales with the wavelength, regardless of the pulse duration. Therefore, the highest precision can be achieved by applying both ultrashort pulses and a short wavelength. This is why our UV ultrafast pulses provide unprecedented material processing quality.



The Laser System

The UV ultrafast laser system comprises a Ti:sapphire laser whose pulses are converted into the UV spectral range by frequency tripling, and a special excimer gain module for amplification in the UV. In this way subpicosecond pulses are obtained at 248 nm with an average power of up to 10 W.

Applications

The technology is applicable to the treatment of solid surfaces with sub-micron precision. A combination of diffractive optical masks with conventional imaging systems allows the generation of complex structures with nanometer-scale features on all materials including metals, semi-

conductors and dielectrics. Parallel processing of large sample areas offers the potential of industrial use of the presented technology.

The pictures (top, right) demonstrate the fabrication of complex 2D structures (photonic crystals, holograms, etc.) on various solids with typical feature sizes of ~200nm. The technique is applicable to the simultaneous (parallel) processing of large sample areas.

treatable materials {
→ Metals
→ Semiconductors
→ Dielectrics

