

*Oddělení diodově čerpaných laserů, sekce výkonových systémů,
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Femtosecond laser-induced periodic surface structures

Jörn Bonse

*BAM Federal Institute for Materials Research and Testing,
Unter den Eichen 87, D-12205 Berlin, Germany*

During the past few years significantly increasing research activities in the field of laser-induced periodic surface structures (LIPSS, ripples) have been reported since the generation of LIPSS in a single-step process provides a simple way of surface nanostructuring towards a control of optical, mechanical, or chemical surface properties.

In this talk, current research state in this field is reviewed. The formation of LIPSS upon irradiation of metals, semiconductors and dielectrics by multiple linearly polarized Ti:sapphire fs-laser pulses ($\tau \sim 30$ -150 fs) is studied experimentally and theoretically. Different types of LIPSS with periods even below 100 nm can be generated [1]. The LIPSS formation mechanisms are analyzed and identified in ultrafast time-resolved experiments [2] and by complementing calculations of the laser-induced carrier dynamics [3]. Applications of LIPSS are outlined, demonstrating for metals their beneficial effect on the tribological performance [4].

- [1] J. Bonse, S. Höhm, A. Rosenfeld, J. Krüger, Appl. Phys. A 110 (2013), 547-551.
- [2] S. Höhm, A. Rosenfeld, J. Krüger, J. Bonse, Appl. Phys. Lett. 102 (2013), 054102.
- [3] T.J.-Y. Derrien, J. Krüger, T.E. Itina, S. Höhm, A. Rosenfeld, J. Bonse, Optics Express 21 (2013), 29643-29655.
- [4] J. Bonse, R. Koter, M. Hartelt, D. Spaltmann, S. Pentzien, S. Höhm, A. Rosenfeld, J. Krüger, Appl. Phys. A (2014), DOI 10.1007/s00339-014-8229-2.

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