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SUPERLASERS FOR THE REAL WORLD

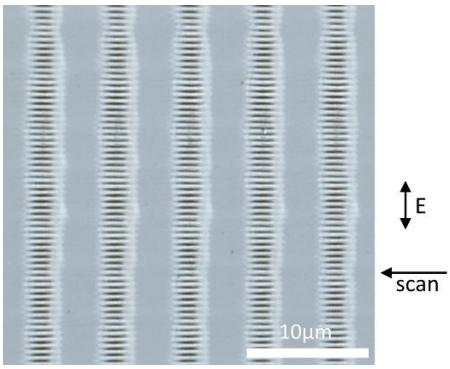
TEAMING FOR SUCCESS

Generation of homogeneous stripes of LIPSS on silicon surface

Juraj Sládek

Laser-induced periodic surface structures (LIPSS) formation with femtosecond pulses is a handy approach for flexible, fast and single step nano-/micro-structuring of various materials. For a number of applications such as tribology, wettability [1], optical properties tuning, anti-bacterial surfaces, tissue adhesion engineering and LIPSS assisted functionalization of 2D materials [2], it is often desirable to produce LIPSS on relatively large area with a high level of homogeneity [3,4] and with controlled periodicity [5].

This seminar presents a study of LIPSS formation on the surface of monocrystalline silicon in a specific fabrication regime of large-area structuring that was recently published [6]. The range of the laser scanning parameters where LIPSS appear in a pattern of periodic stripes is discussed. Within these stripes, LIPSS are parallel to the scanning direction as shown in the figure below. Interestingly, the stripes where the LIPSS emerge are regularly spaced and are primarily located *between* the regions where the fluence of the Gaussian laser beam peaks. The formation mechanism is examined by analyzing connection between local cumulated fluence [7], N-on-1 shot damage geometry and thresholds of modifications. Possible explanation of the processes at play in the generation of such stripes of LIPSS is provided.



Part of a large area of the monocrystalline silicon covered by LIPSS organized in homogeneous stripe structures.

When: Pátek **2. 12. 2022 – 14:00**

Where: Seminární místnost (Perla), HiLASE Centre

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*) *The seminar will be held in English.*