

# JEMNÁ MECHANIKA A OPTIKA

VĚDECKO-TECHNICKÝ ČASOPIS  
ROČNÍK 51 1/2006

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**Laboratory of Interferometry and High-coherence Lasers**  
(J. Lazar, O. Číp, F. Petrů, P. Jedlička, B. Mikel, B. Růžička,  
Z. Buchta, V. Matoušek) ..... 4  
The laboratory follows the tradition of the Department of Quantum light generators of the ISI. The first gas laser in Czechoslovakia was put into operation and commercially successful in interferometric systems were developed here. At present the group deals predominantly with stabilized lasers for etalons of optical frequencies, interferometric techniques with high resolution and direct methods of measurement of index of refraction of air. Traditional links of the group are to the Technical University of Brno, especially to the faculties of electrical and mechanical engineering and to institutes of metrology in the Czech Republic and abroad.

**Laboratory of optical micromanipulation techniques ISI AS CR Brno** (P. Zemánek, P. Ják, J. Ježek, M. Šerý, V. Karásek, T. Čížmár, M. Šiler) ..... 7  
Laboratories of optical micromanipulation techniques (OMITEC – see <http://www.isibrno.cz/omitec>) were founded ten years ago as a part of Department of Quantum Light Generators of Institute of Scientific Instruments. In cooperation with Institute of Physical Engineering of Faculty of Mechanical Engineering of Technical University in Brno intensive research of interactions between laser radiation and solid objects has begun. This research deals with three basic categories – non-contact manipulations with micro- and nano-objects, microablation and using photopolymerization to create structures in microscopic scale.

**Creation of fine holes into quartz glass by electron beam**  
(L. Dupák, J. Dupák, M. Zobač) ..... 10  
This paper shows possibilities of micromachining by pulse electron beam for creation of fine holes into quartz glass. The influence of different parameters of electron beam (such as beam current, focus, pulse duration) is demonstrated. Accelerating voltage of 50 kV, beam current of 0.1 – 1 mA and pulse duration of 15 – 150 ms was applied. Diameter of created holes ranged from  $10^1 \mu\text{m}$  to  $10^0 \text{mm}$  on incident side and from  $10^0$  to  $10^1 \mu\text{m}$  on the opposite side (disc thickness 0.7 mm).

**A cryosurgical instrument for delicate applications**  
(L. Zobač, M. Zobač) ..... 13  
For delicate applications of cryosurgery utilizing freezing of the tissue by liquid nitrogen in facial or eye medicine, and/or dermatology, a low-weight, small-dimensioned, cordless instrument provided with electronic controls has been designed. The instrument with one filling of about 30 ccm of  $\text{LN}_2$  can devitalize up to about 5 grams of tissue to necrosis in a few minutes. The function and construction of the instrument is explained and the results of its technical tests are presented.

**Development and designing of mechanical assembly groups at Meopta-optika, a.s.** (P. Klabazňa) ..... 15  
The article informs about a computer designing of mechanical parts, assemblies and semiassemblies by the designers from the Meopta-optika, a.s. in the systems Autocad and Pro/ENGINEER and describes the technique of mechanical parts, production documentation and mentions the other possibilities of the CAD system in case of a new project designing as well.

**The most significant professional engineering fairs arranged in the first half-year 2006** (jpe) ..... 20

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