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Österreichische Physikalische Gesellschaft

Gemeinsame Jahrestagung in Genf
21. - 25. August 2017

CERN & CICG

Réunion annuelle commune à Genève
21 - 25 août 2017

in Zusammenarbeit mit - en collaboration avec

SAG

CHIPP Swiss Institute of Particle Physics

MARVEL

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Applied Physics & Earth, Atmosphere and Environmental Physics (combined session) Plasma Physics

Thursday, 24.08.2017, CICG: Room 6

Time	ID	Combined Session *Chair: Stéphane Goyette, Uni Genève*
10:45	201	**Kerr lens mode-locked femtosecond thin-disk lasers: towards powerful sub-50 fs oscillators** *Norbert Modsching, Clément Paradis, François Labaye, Maxim Gaponenko, Valentin J. Wittwer, Thomas Südmeyer, University of Neuchâtel* Thin-disk laser (TDL) oscillators generate directly ultrashort pulses at megahertz repetition rates and high average powers. Achievable peak powers in the mega-watt level make it a promising driver for nonlinear experiments. Recent progress of mode locking via the Kerr effect enabled the generation of pulses with durations as short as Yb-doped bulk oscillators. We present the status about our Kerr lens mode locked TDL of the gain materials Yb:Lu_2O_3 and Yb:CALGO, emitting the shortest pulses ever demonstrated by their gain materials and up to 40 % shorter than previous TDL, and discuss the potential for further power scaling.
11:00	202	**Mid-infrared Quantum Cascade Lasers for spectroscopic applications** *Borislav Hinkov, Benedikt Schwarz, Rolf Szedlak, Martin Holzbauer, Andreas Harrer, Hermann Detz, Max Andrews, Gottfried Strasser, TU Wien* Quantum cascade lasers (QCLs) have matured as key-enabling devices for various applications in the mid-IR spectral region between 3-12 μm. They range from food-safety and medical diagnosis to spectroscopy of trace-gas molecules. We will review our recent work on developing highly-integrated and miniaturized laser-detector systems for spectroscopy including bi-functional active region designs (i.e. identical-wavelength emission and detection). Special emphasis is put on surface-emitting ring-cavity waveguides based on 2nd-order DFB-gratings including features like farfield-manipulation, polarization-control and multi-ring designs as well as the implementation of plasmonic waveguides for ridge-emitters to realize lab-on-a-chip configurations. The ring-QCLS are used in gas-sensing and the ridge-emitters in liquid-spectroscopy experiments, respectively.
11:15	203	**COSAMI - A Compact Storage Ring for Actinic Mask Inspection** *Terence Garvey, Leonid Rivkin, Andreas Streun, Albin Wrulich, Yasin Ekinci Paul Scherrer Institut* We present a provisional design of a compact synchrotron light source producing EUV radiation for application in the semiconductor industry. EUV light sources are of great potential interest for this industry. The availability of highly reflective mirrors at 13.5 nm wavelength makes EUV lithography a strong candidate for next generation semiconductor manufacture. Our design is based on a storage ring lattice employing design principles similar to those used in the new family of diffraction limited synchrotron radiation sources. The 430 MeV storage ring, of circumference 25.8 m, would have an emittance of ~ 6 nm-rad. The required EUV wavelength is obtained using a single short-period (16 mm) undulator.
11:30	204	**Size selection of helium nanodroplets for tailoring synthesis of nanostructures** *Monisha Rastogi, Alexander Ritsch, Martin Kuhn, Lorenz Kranabetter Institute for Ion Physics and Applied Physics, University of Innsbruck, Austria* Helium clusters produced via supersonic jet expansions in ultra-high vacuum have wide range of size distributions. Nevertheless, their narrow and size independent velocity distribution has been employed as a key factor for size selection. In this study, same is achieved through passing the ionized helium droplets through deflection in a 90° cylindrical electrostatic sector. This allows precise control of size selection in helium nanoclusters, which further facilitates capping the size of dopant