mined by optical absorption measurements, and temperature dependent Hall-effect was measured to determine the carrier concentration and the mobility.

DS 17.32 Tue 9:30 Poster A

The influence of electric fields on the time-resolved luminescence of hybrid organic-inorganic structures — •Jędrzej Szmytkowski[1,3], Jonas Conradt[1], Peter Marek[2], Teodor Silviu Balaban[2,3], and Heinz Kalt[1,3] — [1]Universität Karlsruhe (TH), Institute of Applied Physics, Karlsruhe, Germany — [2]Karlsruhe Institute of Technology (KIT), Forschungszentrum Karlsruhe, Institute of Nanotechnology, Karlsruhe, Germany — [3]Center for Functional Nanostructures (CFN), Karlsruhe, Germany

The understanding of the process of electron transfer from an organic dye to inorganic material, like TiO_2 and ZnO, is crucial for the fabrication of efficient hybrid solar cells. Time resolved luminescence studies within applied external electric fields have been performed for several hybrid organic-inorganic structures. The decay associated spectra (DAS) have been used to analyze the dynamics of the luminescence decay. This method allows us to control the dissociation of excitons at the interface of organic-inorganic bilayers.

DS 17.33 Tue 9:30 Poster A

Thickness-dependency of electroreflectance spectra at titanium oxide films — •Andreas M. Zoll and Roger Thull — Lehrstuhl und Abteilung für Funktionswerkstoffe der Medizin und Zahnheilkunde, Universitätsklinikum Würzburg, Pleicherwall 2, D-97070 Würzburg

Thick titanium oxide films have not only attractive properties like good blood compatibility and good corrosion resistance making them very suitable for medical implants, but also very interesting electro optical properties investigated in this study.

The presented titanium oxide films are deposited using unfiltered arc sputtering technique on polycrystalline titanium surfaces. The film thickness is 50 - 200 nm depending ion the deposition time. Substrate temperature was kept at 300 °C.

While thin films of approx. 50 nm showed typical features of low-field electroreflectance spectra at transition energies, ER spectra of thicker films showed oscillations in the sub-gap region corresponding to the first derivative of conventional reflectance spectroscopy.

The band gap was determined using photocurrent spectroscopy and was found at 3.05 +/- 0.05 eV for all samples.

DS 17.34 Tue 9:30 Poster A

Subgridding in the FDTD method for simulating the interaction of terahertz radiation with metal — •Andreas Kern, Hanspeter Helm, and Markus Walther — Deptartment of molecular and optical physics, University of Freiburg

Simulating the interaction of electromagnetic terahertz radiation with metals poses difficulties not encountered in the optical regime. Due to a penetration depth small compared to the wavelength, such simulations in the terahertz frequency range require large discretisation volumes with very small grid spacings. To cope with these large scale differences, a novel subgridding scheme was developed that can be used to accurately describe the interaction of long-wavelength radiation with metals while keeping computational costs minimal. Bidirectional coupling between grids allows for the complete integration of refined subdomains into the simulation volume. Implementation in one and two dimensions is demonstrated, and a comparison with theoretical and experimental results is given. Using our technique, we are able to accurately simulate surface-plasmonic effects in terahertz experiments for the first time.

DS 17.35 Tue 9:30 Poster A

INFRARED ELLIPSOMETRY STUDY OF $LaNiO_3/LaAlO_3$ SUPERLATTICES — •Y. Matiks, A.V. Boris, P. Popovich, H.-J. Kim, G. Cristiani, H.-U. Habermeier, and B. Keimer — Max-Planck-Institut für Festkörperforschung, Heisenbergstr. 1, 70569 Stuttgart

The far-IR variable angle spectroscopic ellipsometry, as a power optical technique for the investigation of the dielectric properties of thin films, was used to study electrodynamics of $LaNiO_3/LaAlO_3$ superlattices. These superlattices with different individual layer thickness and number of interfaces were deposited on $SrTiO_3$, $LaSrGaO_4$, $LaSrAlO_4$ substrates by pulsed laser deposition.

We found that an increasing of substrate lattice parameter and a decreasing of individual layer thickness induce the decreasing of the charge carrier density. A decreasing of the thickness of layer to one unit cell leads to the insulator-metal transition in $(LaNiO_3)n/(LaAlO_3)n$ superlattices on $SrTiO_3$ substrate. This metal-insulator transition may be induced by two factors: 1) localization of the electrons in the context of orbital reconstruction at the interfaces; 2) granulating of layers with the thickness close to one unit cell due to the roughness of substrates.

DS 17.36 Tue 9:30 Poster A

Charge transient spectroscopy (QTS) on organic semiconductors and thin films — •Markus Arnold, Axel Fechner, and Dietrich R.T. Zahn — Physics Department, Chemnitz University of Technology, D-09107 Chemnitz

Charge transient spectroscopy (QTS) is an electrical measurement method related to deep-level transient spectroscopy (DLTS) developed originally by Lang [1]. With DLTS it is possible to investigate charge carrier traps by monitoring capacitance transients. The capacitance is that of the space charge region of inorganic semiconductor or Schottky diodes. Therefore one can not measure samples negligible space charge region using DLTS as is the case for organic semiconductors. The increasing interest in organic semiconductors and organic thin films provides strong motivation for the scientists study the properties of organic devices in depth. With QTS it is possible to measure fast charge reloading processes in the samples as a function of time and the temperature with different pulse voltages and pulse widths. As a result one can determine the number of the traps of e.g. in organic field-effect transistors (OFETs).

[1] D. V. Lang; Deep-level transient spectroscopy: A new method to characterize traps in semiconductors; J. Appl. Phys. 45, 3023 (1974).

DS 17.37 Tue 9:30 Poster A

Kogesputterte Materialien - Einflüsse der Zusammensetzung auf verschiedene Eigenschaften unter Berücksichtigung optischer Funktionalität. — •Christina Polenzky — Fraunhofer-Institut für Schicht- und Oberflächentechnik (IST), Bienroder Weg 54e, 38108 Braunschweig, Deutschland

Ein komplexer Ansatz des optischen Filterdesigns beruht auf einem kontinuierlichen, sinusförmigen Brechzahlprofil, sogenannte Rugate-Filter. Die Vorteile dieses Filter-Typs gegenüber einem herkömmlichen HL-Filter liegen darin, dass es keine scharfen Grenzflächen innerhalb des Schichtsystems gibt, die das thermische und mechanische Verhalten eines optischen Filters stark begrenzen können. In der Praxis lässt sich ein kontinuierliches Brechzahlprofil gut realisieren, indem viele dünne Schichten mit geringen Brechungsindexunterschieden übereinander abgeschieden werden. Diese werden prozesstechnisch meist durch das Mischen zweier Einzelmaterialien in unterschiedlichen Anteilen realisiert. Für das Design des Rugate-Filters wurden bisher, soweit bekannt, nur die optischen Eigenschaften berücksichtigt. In der Anwendung stehen den Vorteilen des Rugates (Wegfall von Grenzflächen) höchste Anforderungen an die Schichtstapel hinsichtlich Haftung und Spannung, auch unter Temperaturbelastung, gegenüber. Beide Eigenschaften sind bei Rugates kritischer als bei konventionellen Filtern, da diese tendenziell aufgrund der geringen optischen Dichte dicker ausfallen.

DS 17.38 Tue 9:30 Poster A

Electromigration in Silver Nanowires — •Christian Wirtz, Niemma Buckanie, Frank-Joachim Meyer zu Heringdorf, and Günter Dumpich — Universität Duisburg-Essen , Fachbereich Physik, Lotharstrasse 1 , 47048 Duisburg

We observe electromigration in silver nanowires by in-situ scanning electron microscopy. Single-crystalline nanowires are prepared employing a self-organised growth process, polycrystalline wires by electron beam lithography (EBL). These nanowires are contacted by voltage and current leads, also using an EBL technique. Electromigration is then induced applying current densities in the range of 10^8 A/cm^2 in either two- or four-terminal mode. Under these conditions, the single-crystalline silver nanowires exhibit a direction of mass flow opposed to that found in their polycrystalline counterparts. This effect is currently believed to originate from surface diffusion effects and to be intimately related to the direct force exerted on the ion cores by the electric field. Further research efforts will comprise investigation of irradiated single-crystals and the role of disorder in electromigration processes. This work is supported by the DFG (SFB 616).

DS 17.39 Tue 9:30 Poster A

Threshold switching in as deposited phase change materials — •Christoph Classen, Michael Woda, and Matthias Wuttig —