DF 2: Optical and nonlinear optical properties, photonic I

Time: Monday 11:00–13:00 Location: H11

DF 2.1 Mon 11:00 H11

Relaxation dynamics of mixed phase and amplitude gratings attributed to optically excited small polarons in reduced $LiNbO_3$ — •Hauke Bruening, Raphael-Sung Hardt, Bettina Schoke, and Mirco Imlau — Department of Physics, University of Osnabrück, Barbarastr. 7, D-49069 Osnabrück, Germany

The relaxation dynamics of elementary holographic gratings recorded with intense ns-laser pulses ($\lambda = 532\,\mathrm{nm}$, $\mathrm{I} = 350\,\mathrm{GW/m^2}$) is studied in thermally reduced, nominally undoped $LiNbO_3$ in the time regime of 10^{-8} s to 10^2 s at 785 nm. A stretched exponential decay of the diffraction efficiency is uncovered showing lifetimes in the ms-regime and a stretching coefficient $0{,}7 < \beta < 0{,}9$. By temperature dependent measurements, we can attribute the grating signal to probe light diffraction at a spatial density modulation of small bound Nb_{Li}^{4+}-polarons. Taking the presence of stable Nb_{Li}^{4+}:Nb_{Nb}^{4+}-bipolarons in the ground state into account, the density modulation is recorded via the optical gating mechanism. Remarkably, the initial value of the diffraction efficiency exceeds the expectation value for a pure c($Nb_{Li}^{4+/5+}$)-amplitude grating, i.e., the polaron density modulation is accompanied with a spatial modulation of the index of refraction. We discuss the origin of the phase grating in the frame of a microscopic model for polaron absorption and the presence of intrinsic photovoltaic currents.

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DF 2.2 Mon 11:20 H11

Numerical Investigations of Diffraction Efficiency of Two Center Holographic Recording in Photorefractive Crystals — •Mehmet Kiliç and Riza Demirbilek — Yildiz Technical University, Department of Physics, Davutpasa Campus, 34210 Esenler Istanbul Turkey

This contribution has been withdrawn.

DF 2.3 Mon 11:40 H11

Lasergepumpte Plasmaquelle für ultraschnelle zeitaufgelöste Röntgenbeugung — •Daniel Schick, Peter Gaal, Marc Herzog, Mareike Kiel, Steffen Mitzscherling, Wolfram Leitenberger und Matias Bargheer — Universität Potsdam, Karl-Liebknecht Str. 24-25, 14476 Potsdam-Golm

Lasergepumpte Plasmaquellen eröffnen herausragende neue Möglichkeiten in der zeitaufgelösten Röntgenanalytik. Obwohl es sich bei der Plasmaquelle um ein kompaktes Table-Top System handelt, ist sie mit einer Pulsdauer von ca. 100 fs und einem Photonenfluss von 10^6 Photonen pro Sekunde am Probenort vergleichbar mit Femto-Slicing-Beamlines an Synchrotrons. Die neuartige Plasmaquelle an der Universität Potsdam verwendet ultrakurze, hochintensive Lichtpulse aus einem Titan-Saphir-Verstärker (30 fs, 7 μJ, 1 kHz), um harte Röntgenstrahlung zu erzeugen (Cu K_α). Dazu werden die Lichtpulse auf ein auf Spulen geführtes, 20 μm dünnes Kupferband fokussiert, so dass in einem Fokus von 2 μm Spitzenintensitäten von 10^{18} W/cm^2 erreicht werden. Für Pump-Probe-Experimente wird ein Teil der Ausgangsleistung des Lasers zum Anregen einer Dynamik in einer Probe verwendet. In einem Überblick zeigen wir erste Daten von zeitaufgelösten Röntgenbeugungsexperimenten an oxidischen Übergitterstrukturen.

DF 2.4 Mon 12:00 H11

Glass-ceramics as dielectrica for mobile applications in the GHz-range — •Stephan Knöner[1,2], Martin Letz[2], and Gerhard Jakob[1] — [1]Universität Mainz — [2]Schott AG , Mainz

There is an increasing number of mobile applications, which are working in the range of several GHz, for example GPS-handsets. Important elements of these applications are antennas, which have small dimensions and are working also in the direct vicinity of interfering dielectrica or lossy material, as for example a human body, which is called *body-loading*. Such a *body-loading* leads to detuning of resonances. One approach for solving this problem is to use a dielectric material to confine the electric-field component of the near-field of the antenna in a material so that the antenna characteristics show fewer changes under body-loading. The material, normally ceramics, for so called *Dielectric-Loaded Antennas* need to have several properties, as e.g. a large dielectric constant and a small dielectric loss. Besides having advantages in manufacturing, glass-ceramics obtained from a glassy phase are intrinsic pore free materials, which can be produced with high geometry accuracy. We present results of such glass-ceramics by leaning on known configurations of low loss GHz-ceramics, which were obtained.

DF 2.5 Mon 12:20 H11

Excitation Spectra of some AMX_3 Crystals and their Electronic Energy Levels — •Riza Demirbilek[1], Aysegül Çelik Bozdogan[1], Çigdem Elif Demirci[1], Gökhan Asan[1], Murat Çalişkan[1], and Gönül Özen[2] — [1]Yildiz Technical University, Department of Physics, Davutpasa Campus, 34210 Esenler Istanbul Turkey — [2]Istanbul Technical University, Department of Physics, Ayazaga Campus, 34469 Maslak Istanbul Turkey

This contribution has been withdrawn.

DF 2.6 Mon 12:40 H11

Excitation and Emission Spectra of $RbCdBr_3$-Crystal — •Aysegül Çelik Bozdogan[1], Murat Çaliskan[1], Gönül Özen[2], and Riza Demirbilek[1] — [1]Yildiz Technical University, Department of Physics, Davutpasa Campus, 34210 Esenler Istanbul Turkey — [2]Istanbul Technical University, Department of Physics, Ayazaga Campus, 34469 Maslak Istanbul Turkey

This contribution has been withdrawn.