DF 21: Nano- and microstructured dielectrics (Joint Session with KR)

Time: Thursday 12:00–12:40 Location: GER 37

DF 21.1 Thu 12:00 GER 37

Influence of nano crystallites in barium titanate glass ceramics on the ferroelectric phase transition — •Berit Körbitzer, Martun Hovhannisyan, and Martin Letz — Schott AG, Mainz

Dielectrics based on glass ceramics with ferroelectric phases have potential for application as high power capacitors because of their intrinsic pore-free structure. Due to this property glass ceramics reach high dielectric breakdown strengths compared to conventional ceramic materials. In addition the nano cristalline structure broadens the sharp ferroelectric transitions and allows applications up to 200°C. By solid solution type doping and variation of crystallite size one can influence the ferroelectric transition temperature of barium titanate based glass ceramics. The effect of strontium and zirconium doping on the dielectric properties and glass stability of this system is analysed.

DF 21.2 Thu 12:20 GER 37

Polarization-dependent second harmonic analysis of ferroelectric domain structures in z-cut lithium niobate — •Alex Widhalm[1], Moritz Grothe[1], Gerhard Berth[1,2], and Artur Zrenner[1,2] — [1]Department Physik, Universität Paderborn, 33098 Paderborn, Germany — [2]Center for Optoelectronics and Photonics Paderborn (CeOPP), 33098 Paderborn, Germany

Short-periodic domain grids in ferroelectric materials like lithium niobate (LN) are inevitable to achieve quasi phase matching for sophisticated applications in the visible spectral range. A deeper understanding of the physical processes involved in the periodic inversion of the spontaneous dielectric polarization is essential for guaranteeing sufficient quality of these domain structures. Within this work we study the nonlinear signature of the z-cut surface region of periodically poled LN with integrated Ti waveguide structures by means of second harmonic microscopy. In this context, the polarization-dependent SH-analysis has turned out to be an extremely high contrastive method for imaging the ferroelectric domain structure. In addition this technique enables directly the assignment of polarity. All in all, it has been proven that the occurring nonlinear signatures are essentially determined by the polarization and the tailored crystal structure.