

## **High-Energy Synchrotron Radiation for Charge Density and Materials Science Experiments**

Thomas Lippmann, *Institute for Materials Research, Department WFN (Neutron and Synchrotron Scattering), GKSS Research Center, D-21502 Geesthacht, Germany.* E-mail: thomas.lippmann@gkss.de

Recently it has been shown that high-energy synchrotron radiation is an excellent tool for the measurement of charge densities, because there is no significant affection of the data by absorption and extinction in most practical cases [1,2]. Thus, the enhancement of the data quality compared to 'low-energy' data sets now allows detailed comparisons between experimental and theoretical charge densities, even in the case of 'new materials' like high-Tc superconductors [3].

On the other hand high-energy synchrotron radiation is also very useful for 'classical' materials science experiments, e.g. texture or stress and strain analyses, because of the large intrusion depth, i.e. the possibility of studying not only academic but also 'realistic' samples (size). GKSS is currently building up two high-energy materials science beamlines at DESY, Hamburg, Germany. The concepts of the beamlines will be presented here. Both will be equipped with materials science diffractometers, which can also be used for charge density studies.

[1] Lippmann T., Schneider J.R., *J. Appl. Cryst.*, 2000, **33**, 156. [2] Lippmann T., Schneider J.R., *Acta. Cryst.*, 2000., **A56**, 575. [3] Lippmann T., Blaha P., Andersen N.H., Poulsen H.F., Wolf T., Schneider J.R., *Acta. Cryst.*, 2003., **A59**, 437.

**Keywords: synchrotron radiation experimental, charge density, materials science**