



Master-Arbeit

Growth of oxide semiconductors with magnetron sputter epitaxy

In collaboration with the Fraunhofer FEP the Institute of Solid State Electronics is developing a new variety of magnetron sputtering to expand its use in semiconductor manufacturing.

While wide band gap materials like GaN and SiC have already been adopted for power electronics manufacturing, materials that can withstand even higher power levels are desirable for replacing silicon in devices like thyristors. A recently identified example for such an ultra-wide band gap material is GeO₂.

The aim of this work is to investigate the prospects of growing GeO₂ in the required rutile phase on foreign substrates like sapphire using magnetron sputter epitaxy. This also includes investigating different substrates for their suitability and detailed characterization of the GeO₂ films, especially their electrical properties.

Provided that the experiments are successful, the results will be submitted for publication in a scientific journal.

Tasks

- Growth of GeO₂ on different substrates, including sapphire and TiO₂
- Comparison of different materials regarding their suitability as substrates
- Optimization of growth conditions to obtain phase pure rutile single crystal films
- Structural and electrical characterization of the GeO₂ films

Associated Professor

Prof. Dr. Elizabeth von Hauff

Supervisor and Contact

Dr. A. M. Hinz

Günther-Landgraf-Bau, Raum 1-E09,

E-Mail: alexander_martin.hinz@tu-dresden.de