The COMTESSE System was developed in a cooperation of aixACCT Systems GmbH and the DLR (German Aerospace Center). The task was to develop a measurement system, which is able to measure all important parameters of thermoelectric materials in one single temperature cycle. As a result of this process the COMTESSE System is a flexible and easy to use product for characterization of thermoelectric materials:

**Highlights/Benefits**
- Temperature dependent measurements of the most important thermoelectric material parameters in one single setup and within one temperature cycle:
  - thermal conductivity $\kappa$
  - electrical conductivity $\sigma$
  - Seebeck coefficient $S$
  - Harman ZT
- Reduced measurement time
- Reduced effort for sample preparation
- Compact hardware setup for easy usage
- Structured interface for quick data access
- Different user level – grants access to advanced measurement parameters

**Measurements Principles – electrical conductivity and Harman ZT**
- Drive sample with DC or AC current to determine electrical conductance
- AC measurements increase reproducibility and reliability

**Measurements Principles – Seebeck and thermal conductivity**
- Highly sophisticated COMTESSE amplifier grants maximum resolution

[Image showing measurement data and equipment]

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combined thermoelectric material characterization

Measurement Setup

- Supports various sample geometries
- Symmetric setup allows to measure bidirectional for data verification

Specifications

- Measurement range (typical)
  - Seebeck coefficient: 10-1000µV/K
  - Electrical conductivity: 1-10000S/cm
  - Thermal conductivity: 1-20W/mK

- Measurement accuracy (typical)
  - Seebeck coefficient: S < 5%
  - Electrical conductivity: σ < 10%
  - Thermal conductivity: k < 10%
  - Figure of merit: Harman ZT < 20%

Cooperation

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