

Thermal Transfer Modeling and Testing

As a part of the **ThermoMetaS** project in the **livMatS** Cluster of Excellence, we are looking for a master candidate / student assistant for thermal analysis, modeling and modification of a commercial setup for characterization of thermoelectric generators (TEGs).

Micro-thermoelectric generators (μ TEGs) are miniature solid-state devices that can convert heat into electricity using the principles of the Seebeck effect. Within the **ThermoMetaS** project, μ TEGs are produced via a custom fabrication process, therefore a thorough characterization of the μ TEGs is required to optimize the process parameters. The available characterization setup is designed and validated for large, commercial TEGs only. The task will therefore involve conceptualizing and designing appropriate holders and insulation structures in order to use the system for μ TEGs. This will include thermal modeling of all components with the help of the device manufacturer (Linseis, Germany) in order to assess the error introduced by the smaller device as well as implementing the findings as a separate method into the device software. This work is part of the livMatS Cluster of Excellence (more information: www.livmats.uni-freiburg.de) and will be supervised mainly by a doctoral candidate.

Your tasks

- Getting to know the TEG characterization setup. This includes testing and validating.
- Developing and modeling appropriate holders and insulators for various μ TEG geometries with input and help from the manufacturer (Linseis Germany)
- Thermal simulation of selected geometries in order to assess the added uncertainty from the additional parts and to obtain correction values for the device internal software
- Testing and validating the manufactured / 3D printed parts on the TEG characterization setup vs. simulation

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