

On some basic boundary value problems in thermoelasticity with microtemperatures

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This contribution is devoted to the analytical study of two boundary value problems for the thermoelasticity system with microtemperatures, which is a generalised model that accounts for thermal effects at the microscale through additional temperature fields. Our focus is on two classical boundary value problems: the Dirichlet problem and the second boundary value problem (Neumann-type). Our analysis relies on potential theory and the theory of reducible operators and differential forms. Unlike in the classical framework, the Dirichlet problem is represented by an elastic single-layer thermoelastic potential, while the second problem is formulated using a double-layer thermoelastic potential. This formulation enables us to reduce the resulting singular integral equations to Fredholm systems and establish representability and solvability results under suitable compatibility conditions on the boundary data.

This is a joint work with Vita Leonessa (see 1. and 2.).

References

1. V. Leonessa, A. Malaspina (2025) On the Dirichlet problem for the system of thermoelasticity with microtemperatures. *Mediterranean Journal of Mathematics* **22**, 1–19.
2. V. Leonessa, A. Malaspina (2025) On the second boundary value problem for the system of thermoelasticity with microtemperatures. *Constructive Mathematical Analysis* **8**(Special Issue: ICCMA), 57–67.