

# A finite volume method to estimate heating in additive manufacturing parts with magnetocaloric particles

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## SUMMARY

The development of additive manufacturing has an increasing impact in industry as a competitive technology that can reduce costs, manufacturing times and delivery times for complex parts. Recently, an innovative research is developing focused at 3D-printing of functional parts, e.g. printing of electronic circuits and magnetic wires. In this direction, collaborating with NAITEC and the Physics department of UPNA, we have designed, implemented and validated a numerical algorithm of type finite volumes to simulate the evolution of temperature in heterogeneous solid rectangular prisms featuring electric or magnetocaloric components. Numeric results have been used to improve part designs and have been compared with experimental data. Finally, numerical orders of convergence of the implemented algorithm will be displayed.

**Keywords:** finite volumes, magnetocaloric, additive manufacturing

**AMS Classification:** 65M08, 65Z05, 80M12

## References

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