

## **TOWARD THE USE OF SYMBOLIC MONTE CARLO FOR CONDUCTION-RADIATION COUPLING IN COMPLEX GEOMETRIES**

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**ABSTRACT.** We address the interest of using Symbolic Monte Carlo to obtain a reduced model for conduction-radiation coupling in complex geometries. Symbolic Monte Carlo was successfully used for radiative transfer in a decoupled manner, but no attempt has yet been reported to extend its use to radiation coupled with other modes. Here we show that from a unique Monte Carlo simulation of radiation coupled with conduction in a semi-transparent solid surrounded by a convective flow, it is possible to build a formulation of the local temperature as function of the convective heat transfer coefficient, for instance, including the evaluation of uncertainty. This reduced model (a transfer function) enables to decrease the computation time when the function needs to be evaluated plenty of times for different values of the parameters as in optimization or control algorithms.