

## THE HEAT CONTENT OF POLYGONAL DOMAINS

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Let  $D \subset \mathbb{R}^2$  be a bounded set with polygonal boundary  $\partial D$ . We impose an initial temperature condition on  $\mathbb{R}^2 \setminus \partial D$  and can also impose boundary conditions on the edges of  $\partial D$ , such as a Dirichlet (cooling) boundary condition.

In such a setting, it is natural to ask: how much heat is left inside  $D$  at time  $t$ ? This quantity is the heat content of  $D$ . For small time, it is possible to derive asymptotic expansions for the heat content of  $D$  that depend upon the geometry of  $D$  and of  $\partial D$ .

We first review some of the previously known results for the small-time heat content asymptotics of  $D$  with certain initial conditions and boundary conditions. We then present new results for the case where  $D$  is contained in a larger set with polygonal boundary on which a Neumann (insulating) boundary condition is imposed.

This is based on joint work with Sam Farrington.