

Regularity results for linear parabolic problems in polygons

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We consider an initial boundary value problem for the heat equation in polygons. We concentrate to Neumann boundary conditions, but Dirichlet and mixed conditions can be handled analogously. The regularity of the solution in time and space is well investigated, if the domain is smooth [1], [4]. For nonsmooth domains there are also some results [3], but mostly for Dirichlet boundary conditions.

We start with a short introduction into the semigroup theory, explaining the main features on the basis of one space dimension. Then we go to the strongly continuous linear semigroup theory in Banach spaces and cite the Hille-Yosida theorem. We apply these abstract results to initial boundary value problems in convex and nonconvex polygons working in special function spaces with attached singular functions, which characterize the corner behaviour of the solution, see also [2].

References

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