



Tracts in Mathematics 31

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Estimates for Differential Operators in Half-space

Inequalities for differential operators play a fundamental role in the modern theory of partial differential equations. Among the numerous applications of such inequalities are existence and uniqueness theorems, error estimates for numerical approximations of solutions and for residual terms in asymptotic formulas, as well as results on the structure of the spectrum. The inequalities cover a wide range of differential operators, boundary conditions and norms of the corresponding function spaces.

The book focuses on estimates up to the boundary of a domain. It contains a great variety of inequalities for differential and pseudodifferential operators with constant coefficients. Results of final character are obtained, without any restrictions on the type of differential operators. Algebraic necessary and sufficient conditions for the validity of the corresponding a priori estimates are presented. General criteria are systematically applied to particular types of operators found in classical equations and systems of mathematical physics (such as Lamé's system of static elasticity theory or the linearized Navier–Stokes system), Cauchy–Riemann's operators, Schrödinger operators, among others. The well-known results of Aronszajn, Agmon–Douglis–Nirenberg and Schechter fall into the general scheme, and sometimes are strengthened.

The book will be interesting and useful to a wide audience, including graduate students and specialists in the theory of differential equations.

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