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Abstracts of Plenary and Invited Lectures

Section:

10. Partial Differential Equations

1991 MS Classification: 35K

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Estimates near the boundary for solutions of second order parabolic equations

We consider linear uniformly parabolic equations of second order, with *measurable* coefficients, in a *Lipschitz* cylinder $Q = \Omega \times (0, T)$, in both the *divergence* form

$$Lu = \sum_{i,j=1}^{n} D_i(a_{ij} D_j u) - u_t = 0$$

and the *non-divergence* form

$$Lu = \sum_{i,j=1}^{n} a_{ij} D_i D_j u - u_t = 0$$

where $D_i = \partial/\partial x_i$. We will discuss different (boundary, backward, etc.) forms of the Harnack principle, the Hölder continuity of the quotient of two positive solutions vanishing on a portion of the parabolic boundary, the doubling property of the L-caloric measure on the boundary, the classical Fatou theorem. A general approach to these problems will be demonstrated, which is based on the "standard" Harnack inequality and an elementary estimate for oscillation of solutions near the boundary.