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Remarks on the Dirichlet and state-constraint problems for quasilinear parabolic equations.

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The authors prove two different types of comparison results between semicontinuous viscosity sub- and supersolutions of the generalized Dirichlet problem for quasilinear parabolic equations: the first one is an extension of the strong comparison result obtained previously by the second author for annular domains, to domains with a more complicated geometry. The key point in the proof is a localization argument based on a strong maximum principle type property. The second type of comparison results concerns a mixed Dirichlet-state-constraints problems for quasilinear parabolic equations in annular domains without rotational symmetry; in this case, the authors do not obtain strong comparison result, but a weaker one on the envelopes of the discontinuous solutions. As a consequence of these results and the Perron's method they obtain the existence and the uniqueness of either a continuous or a discontinuous solution.

Reviewer: [Jorge Ferreira \(São João del-Rei\)](#)

MSC:

- [35K60](#) Nonlinear initial, boundary and initial-boundary value problems for linear parabolic equations
- [35K55](#) Nonlinear parabolic equations
- [35B05](#) Oscillation, zeros of solutions, mean value theorems, etc. in context of PDEs
- [35B50](#) Maximum principles in context of PDEs
- [49L25](#) Viscosity solutions to Hamilton-Jacobi equations in optimal control and differential games

Cited in **6** Documents

Keywords:

generalized Dirichlet problem; maximum principle; viscosity solutions; quasilinear elliptic equations; comparison results; Perron's method