

Parabolic Liouville theorems and applications II

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Consider the semilinear heat equation $u_t = \Delta u + |u|^{p-1}u$ on the whole space or a half-space with a subcritical exponent p . Parabolic Liouville theorems state that if u is an entire solution (a solution defined for all times, positive and negative) and u is contained in an admissible class of solutions then $u \equiv 0$. As an admissible class one can take nonnegative solutions or radial solutions with bounded zero number. We present available Liouville theorems and some of their numerous applications. We show in particular, how Liouville theorems and scaling arguments imply universal a priori estimates of solutions of semilinear parabolic equations.