WEIGHTED ESTIMATES AND LARGE TIME BEHAVIOR OF SMALL AMPLITUDE SOLUTIONS TO THE SEMILINEAR HEAT EQUATION

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Abstract. We present a new method to obtain weighted $L^1$-estimates of global solutions to the Cauchy problem for the semilinear heat equation with a simple power of super-critical Fujita exponent. Our approach is based on direct and explicit computations of commutation relations between the heat semigroup and monomial weights in $\mathbb{R}^n$, while it is independent of the standard parabolic arguments which rely on the comparison principle or some compactness arguments. We also give explicit asymptotic profiles with parabolic self-similarity of the global solutions.


Keywords and phrases: Semilinear heat equations, large-time asymptotics, weighted estimates.

REFERENCES


