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Long-Time Dynamics of Solutions to Hardy-Hénon Parabolic Equations

Abstract. We construct asymptotically self-similar global solutions to the Hardy-Hénon parabolic equation for a large class of initial data. The solution may be asymptotic to a self-similar solution of the linear heat equation or to a self-similar solution to the Hardy-Hénon parabolic equation depending on the speed of decay of the initial data at infinity. The asymptotic results are new for the Hénon case. We also prove the stability of the asymptotic profiles. For complex-valued initial data, a more intricate asymptotic behaviors can be shown; if either one of the real part or the imaginary part of the initial data has a faster spatial decay, then the solution exhibits a combined Nonlinear-``Modified Linear" asymptotic behavior, which is completely new even for the Fujita case. This is a joint work with: N. Chikami, M. Ikeda, K. Taniguchi.