# Large-time behavior of unbounded solutions of viscous Hamilton-Jacobi equations in $\mathbb{R}^N$.

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We study the behavior as $t \to +\infty$ of unbounded solutions of the so-called viscous Hamilton-Jacobi equation in the whole space $\mathbb{R}^N$, in the superquadratic case; i.e.,

$$\begin{aligned} u_t - \Delta u + |Du|^p = f(x) \quad &\text{in } \mathbb{R}^N \times (0, +\infty), \\ u(\cdot, 0) = u_0 \quad &\text{in } \mathbb{R}^N, \quad p > 2. \end{aligned}$$

Existence and uniqueness of viscosity solutions are shown with natural hypotheses on the initial data and right-hand side ($u_0$ and $f$, respectively). Assuming also a growth condition on the right-hand side, we obtain what is know as ergodic large-time behavior. Joint work with Guy Barles and Alexander Quaas.