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Title: Fast diffusion to self-similarity: complete spectrum, long-time asymptotics, and numerology

It is known that the confined fast diffusion equation $u_t = \Delta(u^m) + \nabla \cdot (xu)$ (with $1 - \frac{2}{n} < m < 1$) has a radially symmetric equilibrium solution that is a global attractor. Estimates for the rate of convergence have been given by several authors. In the framework of a formalism due to Felix Otto that views the probability measures u als points on a formal Riemannian manifold metrized by the Wasserstein distance, we can show that the eigenvalue problem determining the precise rate of convergence can be solved exactly, with explicit formulas for all eigenvalues, and eigenfunctions expressed in terms of hypergeometric functions. The second and third eigenvalues add extra geometric insight in the convergence towards the attractor.