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Global positive solution to a semi-linear parabolic equation with potential on Riemannian manifold

This paper determines when the Cauchy problem

$$\begin{cases} \partial_t u = \Delta u - Vu + Wu^p & \text{in } M \times (0, \infty) \\ u(\cdot, 0) = u_0(\cdot) & \text{in } M \end{cases}$$

has no global positive solution on a connected non-compact geodesically complete Riemannian manifold for a given triple (V, W, p) . As the principal result of this paper, our theorem optimally extends in a unified way most of the previous results in this subject. Based on joint work with Qingsong Gu, Jie Xiao, and Fanheng Xu.