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Title: Gradient estimates for a weighted nonlinear equation on complete noncompact manifolds

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Ma, Huang and Luo [12] considered $\Delta u + cu^{\alpha} = 0 (\alpha < 0)$ with $\mathrm{Ric}_{ij} \geq -Kg_{ij}$, and obtained some gradient estimates. In the present paper, we investigate the weighted nonlinear equation $\Delta_f u + cu^{-\alpha} = 0$ with $\mathrm{Ric}_f^N \geq -K$, where f is a smooth real-valued function on a complete noncompact Riemannian manifold (M^n, g), $\alpha > 0$ and c are two real constants, and we achieve some gradient estimates for positive solutions of this weighted nonlinear equation. The results posed in this paper can be regarded as a natural generalization of the results in [12].

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