

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

**Author(s):** Jing Li, Guoqing He and Peibiao Zhao

MA, HUANG and LUO [12] considered  $\Delta u + cu^\alpha = 0$  ( $\alpha < 0$ ) with  $\text{Ric}_{ij} \geq -Kg_{ij}$ , and obtained some gradient estimates. In the present paper, we investigate the weighted nonlinear equation  $\Delta_f u + cu^{-\alpha} = 0$  with  $\text{Ric}_f^N \geq -K$ , 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].

**Address:**

Jing Li  
Department of Applied Mathematics  
Nanjing University of  
Science and Technology  
Nanjing, Jiangsu, 210094  
P. R. China

**Address:**

Guoqing He  
Department of Mathematics  
and Applied Mathematics  
Anhui Normal University  
Wuhu, Anhui, 241000  
P. R. China

**Address:**

Peibiao Zhao  
Department of Applied Mathematics  
Nanjing University of  
Science and Technology  
Nanjing, Jiangsu, 210094  
P. R. China