NONEXISTENCE OF SOLUTIONS FOR A CLASS OF DEGENERATE OR SINGULAR EQUATIONS

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Abstract. This paper investigates the following degenerate or singular equations
\[-\text{div}(\nabla u) = A \frac{|x|}{|x|^{2+\alpha}} u + \frac{u^\theta}{|x|^p}, \quad u(x) > 0, \quad x \in \mathbb{R}^n \setminus \{0\},\]
where $a, b \in \mathbb{R}$, $n > 2$, $A \in \mathbb{R}$, $\alpha > 0$ and $\theta > 0$, $p = \frac{2n}{n-2(\alpha+\theta)}$. In various range of the parameters involved, we mainly obtain nonexistence of positive solutions by combining the Kelvin transform, methods of moving planes and moving spheres and classical arguments on ODE’s.

Keywords. Degenerate or singular equations; Radial positive solutions; Kelvin transform; Moving plane methods; Moving sphere methods.

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References


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