

**EXISTENCE AND UNIQUENESS OF THE EIGENVALUE
PROBLEM FOR A SINGULAR ERGODIC CONTROL**

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In this paper, we consider the following gradient constraint problem

$$\max\{-\Delta u(x) + \kappa - f(x), |Du(x)| - 1\} = 0, \quad x \in \mathbb{R}^n,$$

where $n \geq 3$, κ is a real number, and f is a positive, increasing function on \mathbb{R}^n with the behavior $\lim_{\|x\| \rightarrow \infty} f(x)/\|x\| = \infty$. Under certain conditions on the function f , which the convexity condition can be weakened, we provide the existence and uniqueness of positive radial solutions to the problem.

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