THE DIRICHLET PROBLEM FOR SOME SINGULAR ELLIPTIC EQUATIONS INVOLVING THE 1-LAPLACE OPERATOR

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Abstract. We will discuss singular elliptic problems whose simplest model is

$$\begin{cases} -\Delta_1 u = f u^{-\gamma} & x \in \Omega \\ u = 0 & \partial\Omega\,, \end{cases}$$

where $\Delta_1 u = \operatorname{div} \frac{Du}{|Du|}$ is the usual 1-laplace oparor, $0 \leq f \in L^N(\Omega)$, and $\gamma > 0$. For a fairly general class of such problems we prove existence and uniqueness of solutions. We also discuss BV-regularity of such solutions and how it can be related to the regularity of $\partial\Omega$.

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