INVERSE PROBLEMS FOR THE NONLINEAR MODEL RELATED TO p-LAPLACE EQUATION

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Abstract. Inverse problems for non-linear equations have been of great interest recently. We will discuss the p-Calderón problem, which is a nonlinear generalization of the inverse conductivity problem due to Calderón that involves the p-Laplace equation. We will consider here mainly two different types of inverse problems. First one is the enclosure method, which allows one to reconstruct the convex hull of an inclusion in the nonlinear model by using exponentially growing solutions introduced by Wolff. The second one is the interior uniqueness result for the conductivities involving slightly more general nonlinear model. In two dimensions, we show that any two conductivities satisfying $\sigma_1 \geq \sigma_2$ and having the same nonlinear Dirichlet-to-Neumann map must be identical. The proof is based on a monotonicity inequality and the unique continuation principle for p-Laplace type equation. In higher dimensions, where unique continuation is not known, we obtain a similar result for conductivities close to constant.