1108-35-589   **Peiyong Wang*** (`pywang@math.wayne.edu`), 656 W.Kirby, 1150 FAB, WSU, Detroit, MI 48202.
A Free Boundary Problem Associated With The p-Laplacian.

A free boundary problem associated with the p-Laplacian will be introduced, with the existence of a minimizer and a free boundary condition being proved. In addition, non-uniqueness and non-degeneracy of a minimizer is going to be shown. At last, some partial regularity of the free boundary will be presented. The proof of the well-posedness of the problem with the p-Laplacian in general differs substantially from that of the classical problem for the Laplacian in that many nice and useful properties are absent in the general case. In particular, a counterpart of a monotonicity formula for the Laplacian is missing in the general situation. So one needs to find alternatives to secure the above-mentioned results. (Received January 21, 2015)