Classification of isolated singularities for inhomogeneous operators in divergence form

Mihai Mihăilescu

Department of Mathematics, University of Craiova & Research group of the projects PN-II-RU-TE- 2014-4-0007 and PN-III-P4-ID-PCE-2016-0035, "Simion Stoilow" Institute of Mathematics of the Romanian Academy

mmihailes@yahoo.com

Consider the equation $\operatorname{div}\left(\frac{\phi(|\nabla u|)}{|\nabla u|}\nabla u\right) = 0$ on the punctured unit ball from $\mathbb{R}^N$ $(N \geq 2)$, where ϕ is an odd, increasing homeomorphism from $\mathbb{R}$ onto $\mathbb{R}$ of class C^1. Under reasonable assumptions on ϕ we prove that if u is a non-negative solution of our equation, then either 0 is a removable singularity of u or u behaves near 0 as the fundamental solution of the equation investigated here. In particular, our result complements to the case on nonhomogeneous operators in divergence form Bôcher's Theorem (*Bull. Amer. Math. Soc.*, 1903) and some classical results by Serrin (*Acta Math.*, 1964-1965). This presentation is partially supported by CNCS-UEFISCDI Grant No. PN-II-RU-TE- 2014-4-0007.