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Approximations by regular sets and Wiener solutions in metric spaces

Abstract: Let X be a complete metric space equipped with a doubling Borel measure supporting a weak Poincaré inequality. We show that open subsets of X can be approximated by regular sets. This has applications in nonlinear potential theory on metric spaces. In particular it makes it possible to define Wiener solutions of the Dirichlet problem for p-harmonic functions and to show that they coincide with three other notions of generalized solutions.