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A Dirichlet problem for unbounded domains in metric measure spaces

Let Ω be an unbounded locally compact metric measure space that is uniform in its completion $\overline{\Omega}$. When Ω is equipped with a doubling measure satisfying a p-Poincaré inequality and the boundary $\partial\Omega := \overline{\Omega} \setminus \Omega$ is bounded, we solve the p-Dirichlet problem for boundary data in an appropriate Besov class.

This is accomplished by transforming both the metric and the measure on Ω using a weight that depends on the distance to the boundary, rendering Ω bounded while retaining many of its metric and measure properties without perturbing the space near the boundary.

This is joint work with Rikka Korte and Nageswari Shanmugalingam.