## Harmonic functions on metric measure spaces

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We consider metric measure spaces  $(X, d, \mu)$  with a Borel measure which assigns positive value to all balls,  $\Omega \subset X$  is open. We say that a function  $u : \Omega \to \mathbb{R}$  is strongly harmonic in  $\Omega$  if the mean value property

$$u(x) = \oint_{B(x,r)} u(y) d\mu(y)$$

holds for all  $x \in X$  and r > 0 such that  $B(x, r) \in \Omega$ . Moreover, we say that u is *weakly harmonic* in  $\Omega$  when it has the mean value property at every point x with at least one radius  $r^x$ .

We present various properties of strongly and weakly harmonic functions, e.g. Harnack inequality, Hölder and Lipschitz regularity. The class of radial harmonic functions is established. We illustrate our discussion with examples.