Abstract. The recent years have seen dramatic breakthroughs in understanding of equivalence between scale-invariant analytic, geometric, and PDE properties of sets. In particular, boundedness of the harmonic Riesz transform was proved to be equivalent to uniform rectifiability, which further yielded necessary and sufficient conditions for absolute continuity of harmonic measure with respect to the Hausdorff measure on the boundary. Unfortunately, the concept of the harmonic measure is intrinsically restricted to co-dimension 1. In this talk, we introduce a new notion of a ”harmonic” measure, associated to a degenerate linear PDE, which serves lower dimensional sets. We discuss its basic properties, absolute continuity with respect to the Hausdorff measure on rectifiable boundaries, new square function estimates. The underlying analysis can be extended to treat a new version of the fractional Laplacian on Ahlfors regular sets.