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Daniel J Kelleher* (dkellehe@purdue.edu), Dept Of Mathematics, Purdue Univ., 150 N. University St, West Lafayette, IN 47907-2067. *Differential forms on Dirichlet spaces and analysis on fractals.*

We will discuss the possibility of defining intrinsic metrics and vector analysis for measurable Dirichlet forms (quadratic forms on scalar functions) and resistance forms. This vector analysis has applications in constructing a Dirac operator and intrinsic metrics. This construction combines ideas from classical and non-commutative functional analysis. We will discuss the spectral properties of these ideas, as well as how they relate to analytic ideas such as heat kernel estimates. If time permits we shall discuss how this leads to the definition of spectral triples on fractal spaces. (Received January 20, 2015)