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Alexander Teplyaev* (teplyaev@uconn.edu), **Michael Hinz** (mhinz@math.uni-bielefeld.de) and **Daniel Kelleher** (daniel.kelleher@uconn.edu). *Vector analysis for Dirichlet forms on fractals.*

We will discuss a possibility to define vector analysis for measurable Dirichlet forms (quadratic forms on scalar functions), with applications to the self-adjointness of the magnetic Laplacian and the Dirac operator (this construction combines ideas from classical and non-commutative functional analysis), and the existence of the intrinsic metrics. After that we will show how these ideas lead to the Hodge theorem and the existence and uniqueness for the Navier-Stokes equations for topologically one-dimensional spaces with strong local Dirichlet forms that can have arbitrary large Hausdorff and spectral dimensions. (Received September 16, 2013)