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Yiran Li and **Robert Strichartz**. *Hodge-deRham Theory of K-Forms on Carpet Type
Fractals*. Preliminary report.

There have been several approaches to developing an analogue of the Hodge-deRham theory of k-forms on the Sierpinski gasket (SG) and other post-critically finite (pcf) fractals. In this paper we extend the approach in [ACSY] to the Sierpinski carpet (SC) and a related fractal that we call the magic carpet (MC). These fractals are not finitely ramified, and this creates technical difficulties in proving that the conjectured theoretical framework is valid. On the other hand, the structure of “2-dimensional” cells intersecting along “1-dimensional” edges allows for a nontrivial theory of 2-forms. Our results are largely experimental, but they lead to a conjectured theory that is more coherent than for SG. (Received September 25, 2012)