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Nathan Cohen* (ncohen@fractenna.com). *Fractal Antennas, Resonators, and Invisibility Cloaks: Nuggets from the Tortuous Path.*

Since 1988 self similarity has been discovered to be a key tool that has defined a new branch in RF and electronics. Focusing on antennas, resonators, metamaterials, and related devices, fractal structures accomplish a variety of benefits simultaneously, not achieved with other techniques. These include, among others: wider bandwidth; multibandedness; phasing control; shrinking sizes; higher gains; part (component) reduction; and cost reduction. In addition self similarity is a prescription for frequency invariance, one of a few key insights that fractals have shown so far in natural law. Here, examples of these applied mathematical benefits of fractals will be shown, including a live demonstration. (Received September 22, 2011)