1014-00-1618   **Daniel R Van Vliet*** (`dvanvliet@math.wvu.edu`), Dept. of Mathematics, P.O. Box 6310, West Virginia University, Morgantown, WV 26506-6310. *A Reformulation of the Empirical Mode Decomposition.*

The Empirical Mode Decomposition (EMD) method has shown promise in extracting meaningful information from data sets that do not lend themselves well to other methods of signal analysis. However, a lack of theoretical rigor in its definition and implementation has kept EMD from broad acceptance as a rigorous signal decomposition method.

The EMD method decomposes signals into Intrinsic Mode Functions (IMFs). Using a data-driven algorithm, these component IMFs can be extracted from signals that do not lend themselves easily to other methods of analysis. Early results show great promise. However, shortcomings in the definition of the method mean that signal analysis concepts like convergence are difficult to apply. There have also been counterexamples raised which point out problems with the definition of IMFs as currently stated.

By looking at the intent behind the EMD method and the component IMF functions, a similar decomposition method is derived. This new method lends itself more naturally to convergence analysis, and also avoids (by definition) the counterexamples which haunt IMFs. In fact, the resolution of these problems with the EMD method sheds further light on how an EMD-type decomposition should be understood. (Received September 28, 2005)