1035-00-556 **Reginald N Meeson*** (rmeeson@ida.org), Institute for Defense Analyses, 4850 Mark Center Drive, Alexandria, VA 22311. *A Non-Linear Filtering Process for Empirical Mode Decomposition.*

Huang originally described empirical mode decomposition (EMD) informally as a form of nonlinear filtering. The curve-fitting EMD algorithm Huang devised, however, is not easily recognized as a filtering process. This presentation describes a nonlinear signal transformation that allows conventional digital filtering to separate signals into EMD's intrinsic mode functions (IMF's). The transformation requires distorting or "warping" the input signal's time scale so that the phase of the highest-frequency IMF becomes linear. Initial estimates of the phase are based on the signal's peaks, as in Huang's process. This time warping gives the highest-frequency IMF a fixed-frequency carrier, which allows the IMF to be separated from its lower-frequency trend by conventional filtering techniques. In its warped state, a root mean square (rms) estimate of the IMF's amplitude is also extracted. This process generates only an approximate IMF because the trend and amplitude mask the location of the IMF carrier's peaks and zero crossings used to estimate the phase. Iterating the time warping and filtering processes, similar to Huang's "sifting" process, converges rapidly to stable IMF, amplitude, and trend estimates. Results are very similar to those produced by Huang's algorithm. (Received September 11, 2007)