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Matthew Fickus* (Matthew.Fickus@afit.edu) and **Melody L. Massar**. *Fast computation of spectral centroids*.

The spectral centroid of a signal is the curve obtained by taking centroids of fixed-time cross sections of its spectrogram. It provides a robust estimate of the dominant frequency of a signal at any given time, and as such, is a useful tool in many applications, such as speech processing. We provide a fast algorithm for the computation of spectral centroids that exploits the fast Fourier transform and properties of Toeplitz matrices. We then apply this theory to a biometric problem, namely, the estimation of a person's heart and breath rates from the Doppler shift induced in a continuous wave radar signal by their body movements. (Received November 01, 2008)