

1035-N1-1341 **Michelle L Ghrist*** (michelle.ghrist@usafa.edu). *Demonstrating Fourier Series and Its Applications Through Music*. Preliminary report.

Students can have a difficult time recognizing the practical significance of Fourier series. Through the use of a simple Fast Fourier Transform applet and my musical abilities as a flautist, I can demonstrate to students the concepts of frequency spectra, overtones, harmonics, FFT's, different tuning systems, amplitude, vibrato, and properties of different instruments, for example. In addition, we discuss the applications of Fourier synthesis, stereo receivers, sonar, radar, and voice recognition software. I have used various parts of this demonstration in Advanced Engineering Math, Mathematical Physics, and Partial Differential Equations courses, as well as in an elementary school "Math and Science" night. In this talk, I offer a demonstration of how I use this in class, including the use of my flute, piccolo, recorder, and penny whistle. (Received September 19, 2007)