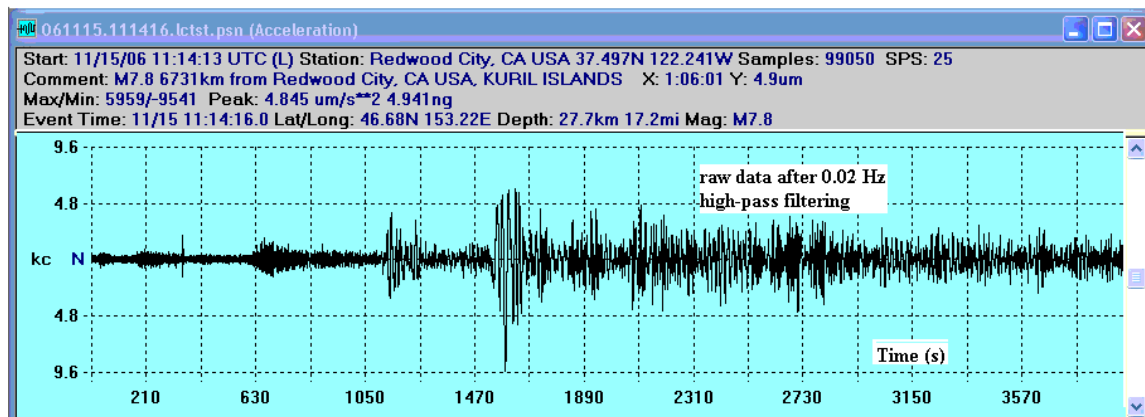
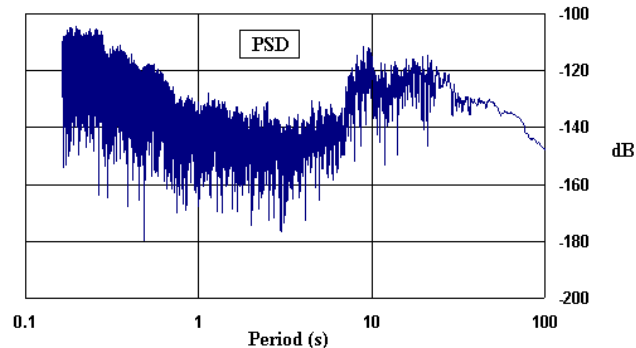


# Physics Seminar

Wednesday 11/24/2007, 4:30pm  
Willet Science Center 101

**Randall Peters**  
Department of Physics  
Mercer University

## Laying Foundations of Science with Excel



Many of us, both faculty and students, are quite familiar with the features of Excel that involve the simple graphing of data. The 'toolpak' portion of the software provides so many additional features of data analysis type, that nobody is likely to have mastered all of them. This talk will focus on the use of some of these analysis tools to improve both teaching and research. Examples will be taken from three different experiences of the speaker: (i) teaching of the analytical mechanics (classical physics core) course of Mercer's Physics Department, (ii) the interpretation of accelerometer data from a Mercer Medical School cardiovascular clinical study, and (iii) efforts to eliminate 'bad science' associated with the display of power spectral densities (PSD) of earth motions, based on seismometer output. Concerning (iii): the term 'power' is used in a seismometer-industry standard representation, even though the units of what is presented are not consistent with power. In contrast with the industry standard, an example is provided below of a (specific) PSD having proper units in dB relative to  $\text{m}^2 \text{s}^{-3}$  per  $1/6^{\text{th}}$  decade (top graph). The hump showing up in the period-range from 7 s to 25 s is due to the magnitude 7.8 Kuril Islands earthquake of 15 Nov 06. The temporal record of this event is shown in the lower graph, the data of which were recorded in California.

***Please join us for light refreshments at 4:15pm outside WSC 109.***