Problems Week 6

Due Thursday, November 9, 2017

1. **Evaluate whether using a 50% overlap modifies the degrees of freedom.**
   In the last problem set you tested the χ^2 formulation for assigning error bars to
   spectra. Now (for the white noise case only) modify your artificial data set to have
   white noise data segments that overlap by 50%. Compute spectra (again using a
   Hanning window). Do the empirical error bars from the Monte Carlo process match
   your expectations based on the number of segments that you have available? Does
   the use of overlapping segments reduce your effective degrees of freedom? If you
   don't window, does the use of overlapping segments reduce your effective degrees
   of freedom? The Lecture 9 notes replicate 2 tables from a couple of textbooks that
   don't appear to agree. Which, if any, of these tables appears to be more useful for
   the Hanning window? Do you think the results would change if you considered red
   noise?

2. **Compute a spectrum of the pressure data** that you used in problem sets 3
   and 4 following the best practices that we have discussed in class:

   a Be attentive in labeling your x axis.

   b Be attentive in labeling your y axis.

   c Provide an uncertainty estimate.