**Final exercise**

Two time series (A.txt and B.txt) are given in the attached txt files. The series are sampled at dt=0.004sec and each of them contains 256 samples.

A wavelet is provided in WAVELT1.txt and WAVELT2.txt. Both have 16 samples with dt=0.004sec

(\*) Use a standard (base 2) complex-complex FFT for the calculations.

(\*) All plots, except for the amplitude spectrum – in the time domain.

1. Convolve each of the series with the provided wavelets (in the time domain) to produce A1(t), A2(t) and B1(t), B2(t)
2. Plot the four traces
3. Cross-correlate A1 with B1 and plot the result (once after calculation in the time domain and once after calculation in the freq. domain)
4. Calculate the autocorrelation of A1(t) and A2(t). Plot the results.
5. Resample A2(t) to 0.002sec and plot the result
6. Resample A2(t) to 0.008sec and plot the result
7. Plot the amplitude spectrum of the original (A2(t)) and the two re-sampled traces in a comparative manner
8. If the re-sampled data are aliased, apply an appropriate filter (before step 4 or 5) and add the result to the plot in step 6.
9. Analyze the two wavelets and determine if they are minimum-phase. (plot the cumulative energy and check the wavelets by Z transform).