

## Homework Assignment no. 3

### RATIONAL PARAMETRIC METHODS FOR LINE SPECTRA

**Deadline: Sept 26**

This second homework is based on **Exercise C3.17**.

For your convenience code for the different spectral estimators can be downloaded at <http://www.prenhall.com/stoica>. Make sure that you use these functions correctly (Use “help”. If still in doubt how to use the functions, try by inspecting the code directly.). Here follow some explanations and clarifications for the corresponding parts of **Exercise C3.17**:

#### **AR and ARMA Estimators for Line Spectral Estimation**

(a)

The true spectrum is given. Verify that the expression for  $\phi(\omega)$  is correct. Use the true spectrum as a reference for the remaining parts.

(b)

The Yule-Walker and modified Yule-Walker methods use the ACS sequence to compute the parameters. Usually the ACS sequence is estimated from the data. Here you have to use the *true* ACS. Use (4.1.6) to compute the true ACS for the given process. Now modify the m-files so as to use this true ACS sequence instead of an estimated sequence. For example, you can modify the function so that the true ACS sequence is passed rather than the data. In that case the computation of  $r(k)$  inside the m-file is unnecessary. Using the true ACS helps to eliminate the effects of estimation and study the resolution properties of various methods.

(c)

Skip

(d)

Skip

(e)

Skip