

# Stochastic Processes II (FP-7.5)

## Problem set 10

### Problem 10.1: Transformation for trend elimination

Let assume that  $\{Y(n)\}$  is a random sequence whose components are expressed as

$$Y(n) = an^2 + V(n),$$

where  $a$  is a constant and  $\{V(n)\}$  is a zero-mean WSS process.

- Find a transformation that transforms  $\{Y(n)\}$  into a WSS process  $\{X(n)\}$ .
- Compute the autocorrelation function of  $\{X(n)\}$  as a function of that of  $\{V(n)\}$ .

### Problem 10.2: Wölfer sunspot series

- Fit an AR(3) model to the series and plot the resulting estimated power spectrum.
- Repeat the procedure using an ARMA(9,1) model.

The sunspot data and an example of using Matlab routine finding the ARMA coefficients can be downloaded from the course webpage.