

Statistics 248 - Homework 8 (D. R. Brillinger)

Suppose that $X(\cdot)$ and $Y(\cdot)$ are independent stationary time series with means 0 and autocovariance functions $c_{XX}(\cdot)$ and $c_{YY}(\cdot)$ respectively.

a) Show that the autocovariance function of the product series $Z(t) = X(t)Y(t)$, $t = 0, \pm 1, \pm 2, \dots$ is given by

$$c_{ZZ}(u) = c_{XX}(u)c_{YY}(u)$$

for $u = 0, \pm 1, \pm 2, \dots$.

b) Set down an expression for the autocovariance function when the series do not have mean 0.