

27 April 01

Realizable Case

$$Y(t) = \sum_{u=0}^{\infty} a(u) X(t-u) + \varepsilon(t)$$

$\times X(t-u)$

$$\sum_{u=0}^{\infty} a(u) c_{XX}(v-u) = c_{YX}(v) \quad v=0, 1, \dots$$

Weiner-Hopf equation

Set $c(v) = \frac{1}{2\pi} \int_{-\pi}^{\pi} e^{i v \lambda} \log f_{XX}(\lambda) d\lambda$

then

$$\sigma^2 = 2\pi \exp\{c(0)\}$$

Set $B(\lambda) = \exp\left\{i \sum_{v=1}^{\infty} c(v) \sin v \lambda\right\}$

Set $d(u) = \frac{1}{2\pi} \int_{-\pi}^{\pi} e^{i u \lambda} f_{YX}(\lambda) \overline{B(\lambda)} d\lambda$

Set $A(\lambda) = \frac{2\pi}{\sigma^2} B(\lambda) \left\{ \sum_{u=0}^{\infty} d(u) e^{-i u \lambda} \right\}$

Bhansali