SMP

Opg. 3.15

R_{xx}-egenskaber for reelle WSS stokastiske variable:

1. $E(X^2) = R_{xx}(0) \geq 0$
2. $R_{xx}(\tau) = R_{xx}(-\tau)$ (lige fkt.)
3. $|R_{xx}(\tau)| \leq R_{xx}(0)$

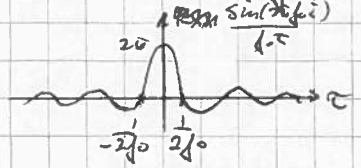
a) $R_{xx}(\tau) = \frac{1}{1+2\tau^2}$ ✓

1. $R_{xx}(0) = 1 \geq 0$ ✓
2. $R_{xx}(-\tau) = R_{xx}(\tau)$ ✓
3. $R_{xx}(\tau) \leq 1 = R_{xx}(0)$ ✓

b) $R_{xx}(\tau) = 2\sin(2\pi \cdot 1000\tau)$ ~/.

1. $R_{xx}(0) = 0$ ✓
2. $R_{xx}(-\tau) = -R_{xx}(\tau)$ ~/.
3. $R_{xx}\left(\frac{1}{4000}\right) = 2 > 0 = R_{xx}(0)$ ~/.

c) $R_{xx}(\tau) = \frac{\sin(2\pi f_0 \tau)}{1 \cdot \tau}$ ✓



1. $R_{xx}(0) = 2\pi \geq 0$ ✓
2. $R_{xx}(-\tau) = R_{xx}(\tau)$ ✓
3. $|R_{xx}(\tau)| \leq 2\pi = R_{xx}(0)$ ✓

d) $R_{xx}(\tau) = \delta(\tau) + \cos(2\pi f_0 \cdot \tau)$ ✓

1. $R_{xx}(0) = \delta(0) + 1 \geq 0$ ✓
2. $R_{xx}(-\tau) = R_{xx}(\tau)$ ✓
3. $|R_{xx}(\tau)| \leq 1 < R_{xx}(0)$ ✓ for $\tau \neq 0$