

	classmate
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	Targo
25 35.1	LESS 23. REPET: UNIT 1 INTRODUCTION TO PORTER
	for a function to 88R, be SSR,
	CDE: F <sub>2</sub> (x <sub>2</sub> + ) = (x c <sub>3</sub> ) ≤ x <sub>2</sub> )
	Weak Sense Stationary: conditions:
	The Property
	02.57.0
i.	
	Sakuradio , O . I
ii.	
le.	should be equal to time difference.
=	= (x) = (x) yew
6	Protiperties: Autocorrelation: WSS
	* Constitute  *
ì	IRXX(C) SRXX(O) C C C D MA .E
	nosm : M
ji.	Rxx(T) = Rxx (-T) = Symmetric
	TXX TITE
[7,41 × iii	$R_{xx}(0) = E[x^2(t)] : noH_{x}(0) = e^{-x^2(t)}$
is	DU (T)
- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	· Rxx (T): no arbitary shape.
	if c [was ] see
V•	17 E EXCED J 20 and exengodic
	ITI→ ® Rxx(Z) = Ux2.
	47 + + * * ( 4 + + ) * * * * * * * * * * * * * * * * *
_	*
	ロナナ ナヤ (ロナナ) y7 = 15) y7
	if $E[x(t)] \neq 0$ and exergodic $\lim_{ x  \to \infty} R_{xx}(z) = U_{x}^{2}.$

$$E[X(+)] = \prod_{z \in \mathbb{Z}} x(+) \text{ at } \Rightarrow \text{ergodic}$$

$$\lim_{z \in \mathbb{Z}} R_{xx}(z) = U_{x}^{2}.$$

$$|z| \to \infty$$

$$-(y-u)^{2}$$
. ND: 1 - (2 - 2 - 2)

$$\sin(2\pi - \theta) = -\sin\theta$$

$$\sin(\pi + \theta) = +\cos\theta$$

$$\frac{\sin(\pi + \theta) = \cos \theta}{2}$$

$$\cos \theta : \text{ even } ; \sin \theta : \text{ odd}.$$

cos0: even; 
$$sin\theta:odd$$
.

$$\int odd = 0$$

$$\frac{\partial cos\theta}{\partial cos\theta} = \frac{\partial cos$$

32001 = 51 = +i

 $a + ib = cos\theta + isin\theta$ 

1. FT of 
$$f(x) = 1$$
  $f(x)e^{iS\omega x}$ 

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2.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

3.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

4.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

5.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

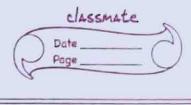
6.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

7.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

8.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

9.  $f(x) = 1$   $f(x)e^{iS\omega x}$ 

1.  $f(x) = 1$   $f$ 



## Properties: PSD.

If the PSD at 0 freq. (ie.  $\omega = 0$ ) is the total area under the graph of the  $R_{xx}(z)$  function

$$R(0) = E[x^2(t)]$$

S(-w) = S(w): even func | symmetric.

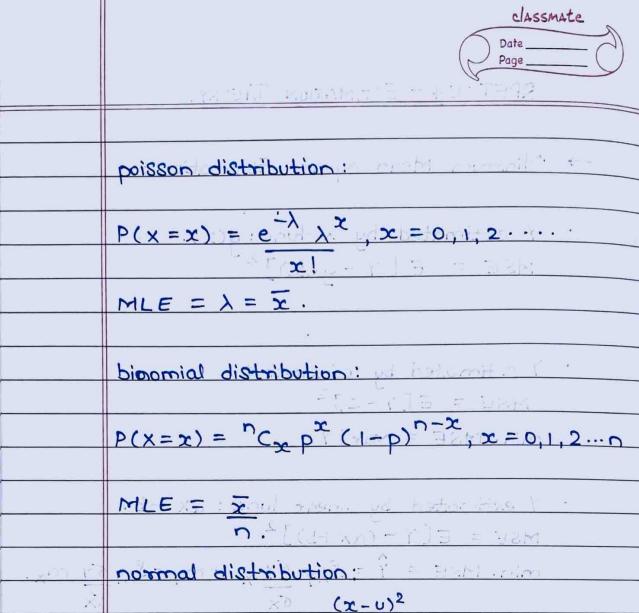
If 
$$\int_{-\infty}^{\infty} |R(z)| dz < \infty$$
, then  $S(\omega)$  is a constant func. of 'w'.

Properties: CPSD.

 $S_{xy}(-\omega) = S_{xy}^*(\omega)$ 

$$S_{xy}(\omega) = S_{yx}(-\omega)$$

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	RPET: U4 - ESTIMATION THEORY.
$\rightarrow$	Minimum Mean Square Estimation:
•	Y estimated by X functions
	Y estimated by $x$ func: $g(x)$ .  MSE = $E[Y-g(x)]^2$
	Y 001' lot 1
	Y estimated by constant con lamand
	$MSE = E[Y-C]^2$
12	min MSE = var (Y)
•	Y'estimated by linear func: ax + b.
	$MSE = E[Y - (ax + b)]^{2}$
	min. MSE = ŷ = Sxy Gy x + my - Sxy GY mx.
U	S(U-10) 0X 0X
=	= (x) +
	$a^* = \cos(x, y) = E[xy] - E[x]E[y]$
	$\alpha^* = \frac{\cos \cos \cos(x,y)}{6x^2} = \frac{E[xy] - E[x]E[y]}{E[xy] + E[xy]}$
	b* = my = a* mz.
	$Y = a^* + b^*x.$
	= Cxpacental distribution;
$\rightarrow$	Maximum Likelihood Estimation:
<u> </u>	Step 1: $L \neq 0$ ) = $f(x_1, \theta) \cdot f(x_2, \theta) \cdot \cdots \cdot f(x_N, \theta)$
	step 2: log (L) = log[f(x,,0)] + log[f(x2,0)+
	step 3: differentiate with parameter partially
	1 <u>9</u> L
	L 90



$$f_{\mathbf{x}}(\mathbf{x}) = 1 e^{\frac{2\sigma}{2\sigma}}$$

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$$= 6^{2} = (x_{1} - u)^{2} + (x_{2} - u)^{2} + \dots + (x_{n} - u)^{2}$$

$$f(x) = \lambda e^{-\lambda x}, x > 0.$$

$$(x) = \lambda e^{-\lambda x}, x > 0.$$

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exponential distribution: