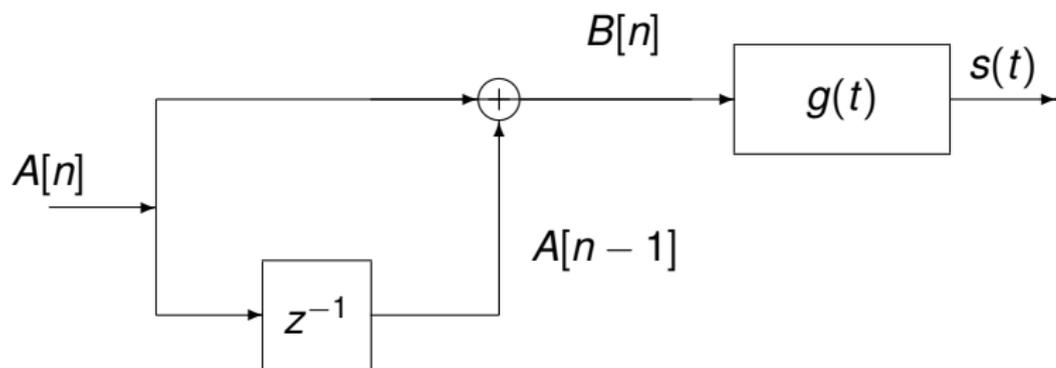


TEMA 2

EJEMPLOS

Ejemplo 1: Secuencia de datos coloreada



- Secuencia blanca $A[n]$: 2-PAM ($A[n] \in \{\pm 1\}$)
- Secuencia coloreada $B[n]$:

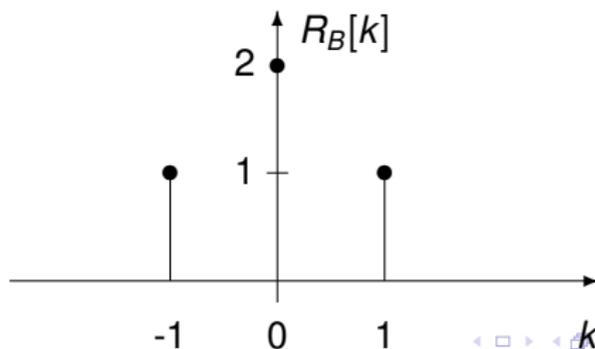
$$B[n] = A[n] + A[n - 1],$$

$$s(t) = \sum_{n=-\infty}^{\infty} B[n] \cdot g(t - nT)$$

Función de autocorrelación de $B[n]$

- Autocorrelación de $A[n]$: $R_A[k] = E_s \cdot \delta[k] = \delta[k]$
- Autocorrelación de $B[n]$

$$\begin{aligned}R_B[k] &= E \{B[n]B^*[n+k]\} \\&= E \{(A[n] + A[n-1]) \cdot (A[n+k] + A[n+k-1])\} \\&= E \{A[n]A[n+k]\} + E \{A[n]A[n+k-1]\} \\&\quad + E \{A[n-1]A[n+k]\} + E \{A[n-1]A[n+k-1]\} \\&= R_A[k] + R_A[k-1] + R_A[k+1] + R_A[k] \\&= 2R_A[k] + R_A[k-1] + R_A[k+1]\end{aligned}$$



Densidad espectral de potencia

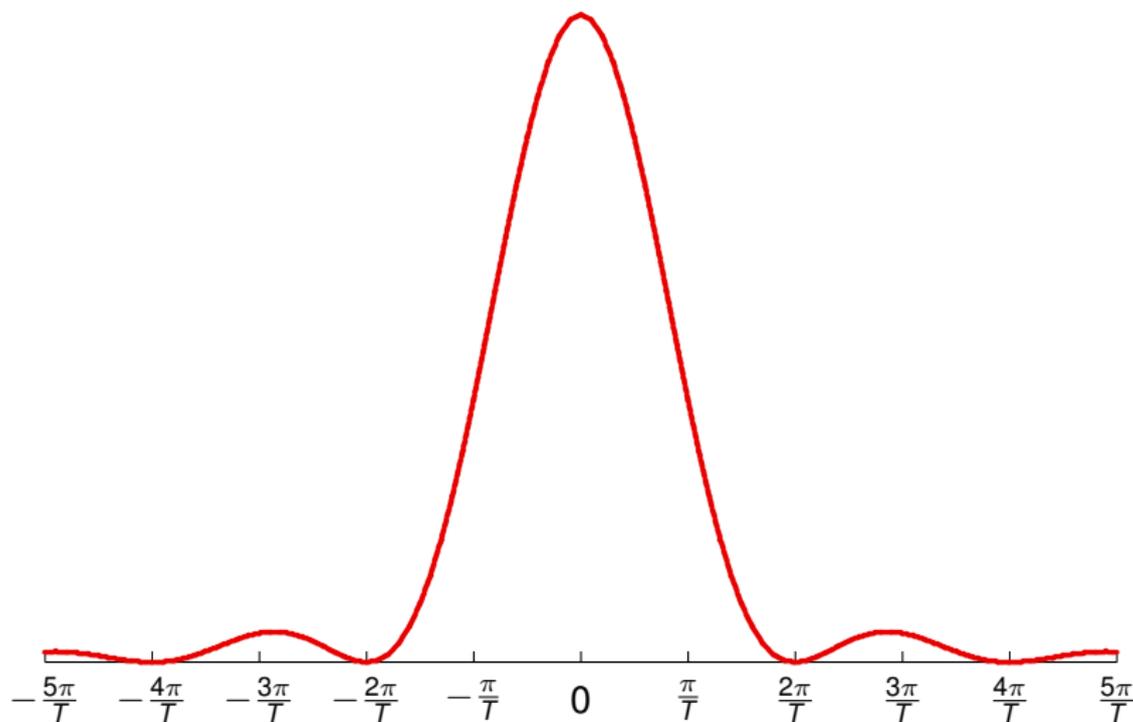
- Secuencia $B[n]$

$$\begin{aligned} S_B(e^{j\omega}) &= \mathcal{TF} \{R_B[k]\} = \sum_k R_B[k] \cdot e^{-j\omega k} \\ &= 2 \cdot E_s \cdot e^{j\omega \cdot 0} + E_s \cdot e^{j\omega \cdot 1} + E_s \cdot e^{-j\omega \cdot 1} \\ &= 2 \cdot E_s \cdot \{1 + \cos(\omega)\} \end{aligned}$$

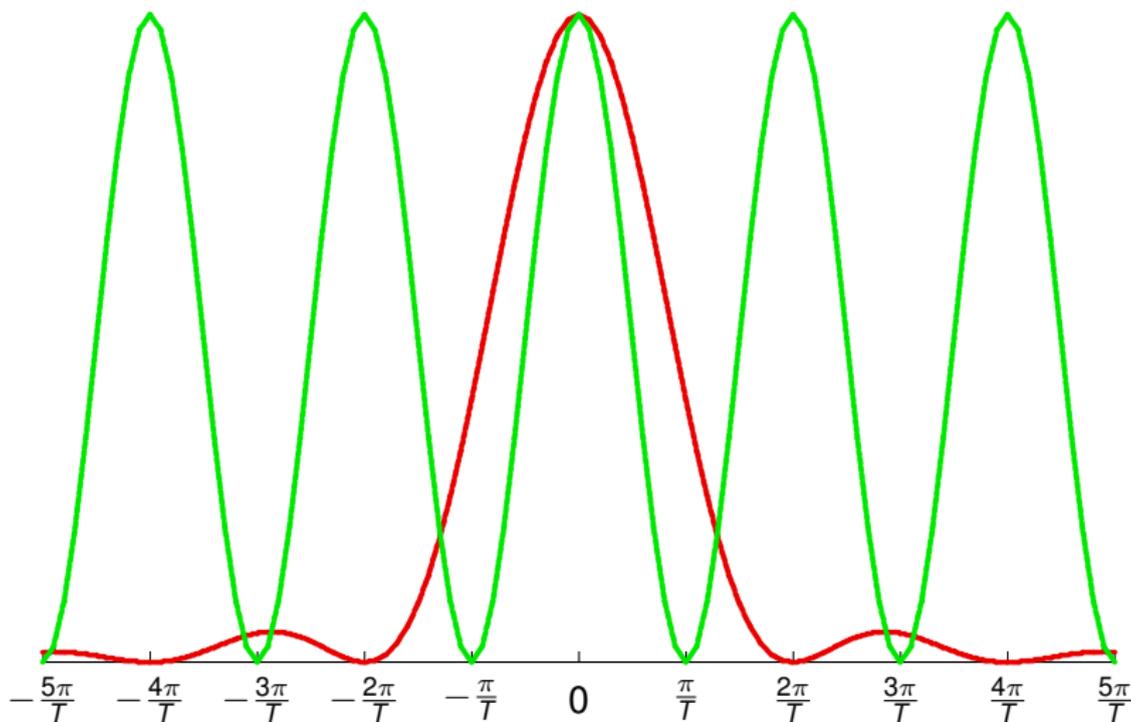
- Señal PAM en banda base

$$S_s(j\omega) = \frac{2 \cdot E_s}{T_s} [1 + \cos(\omega T)] \cdot |G(j\omega)|^2$$

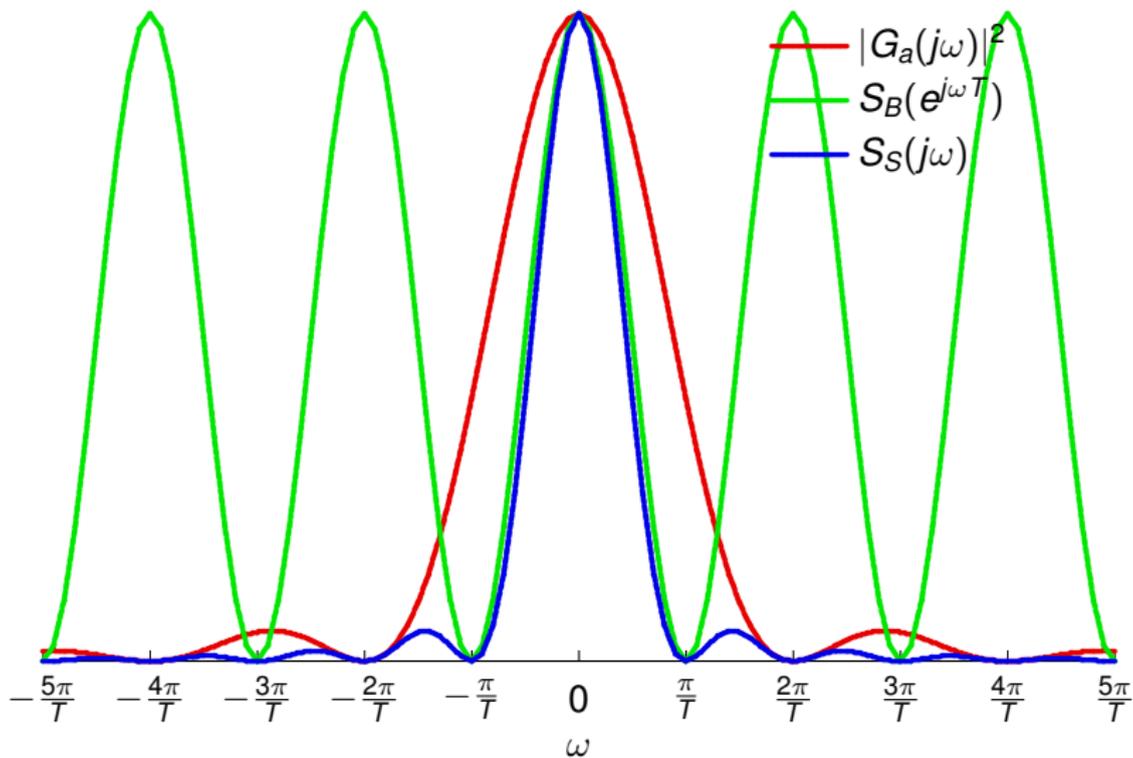
Densidad espectral de potencia con $g_a(t)$



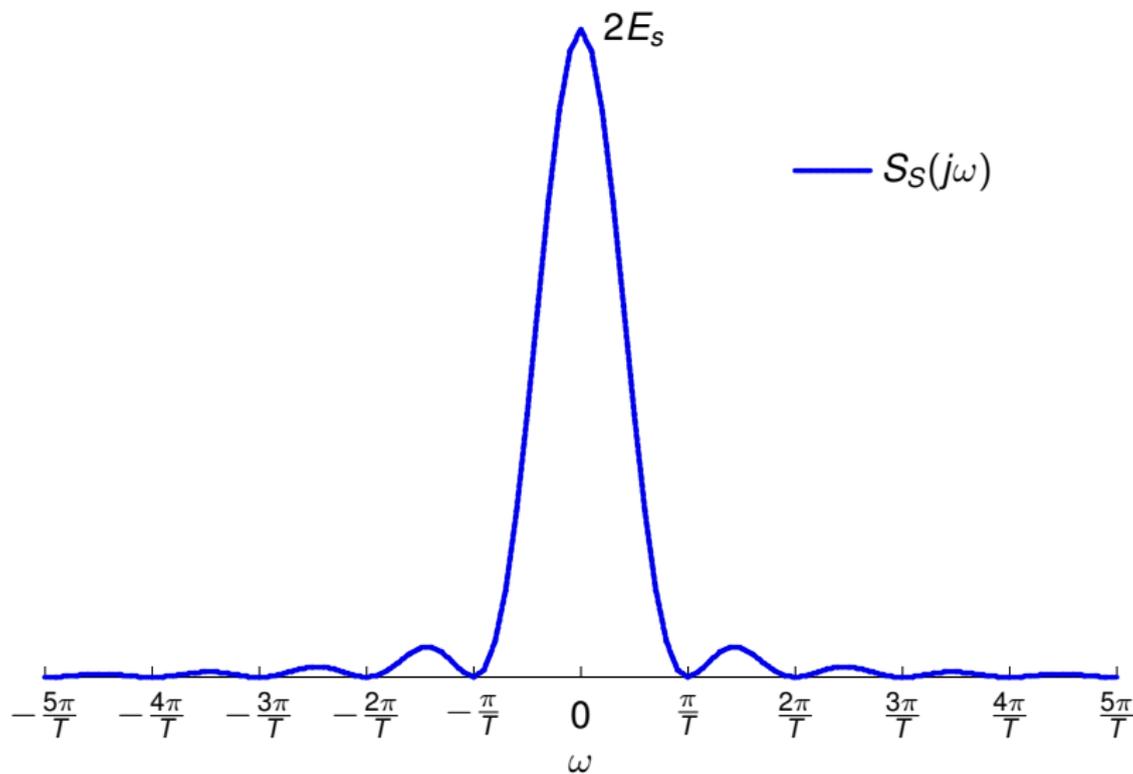
Densidad espectral de potencia con $g_a(t)$



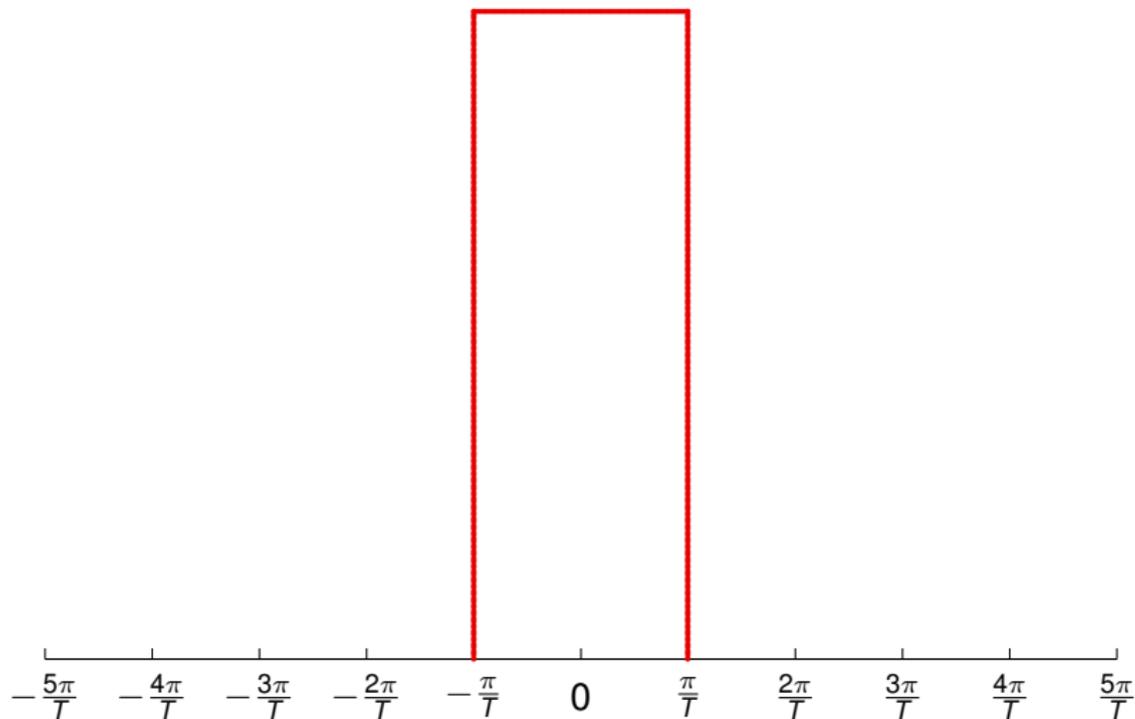
Densidad espectral de potencia con $g_a(t)$



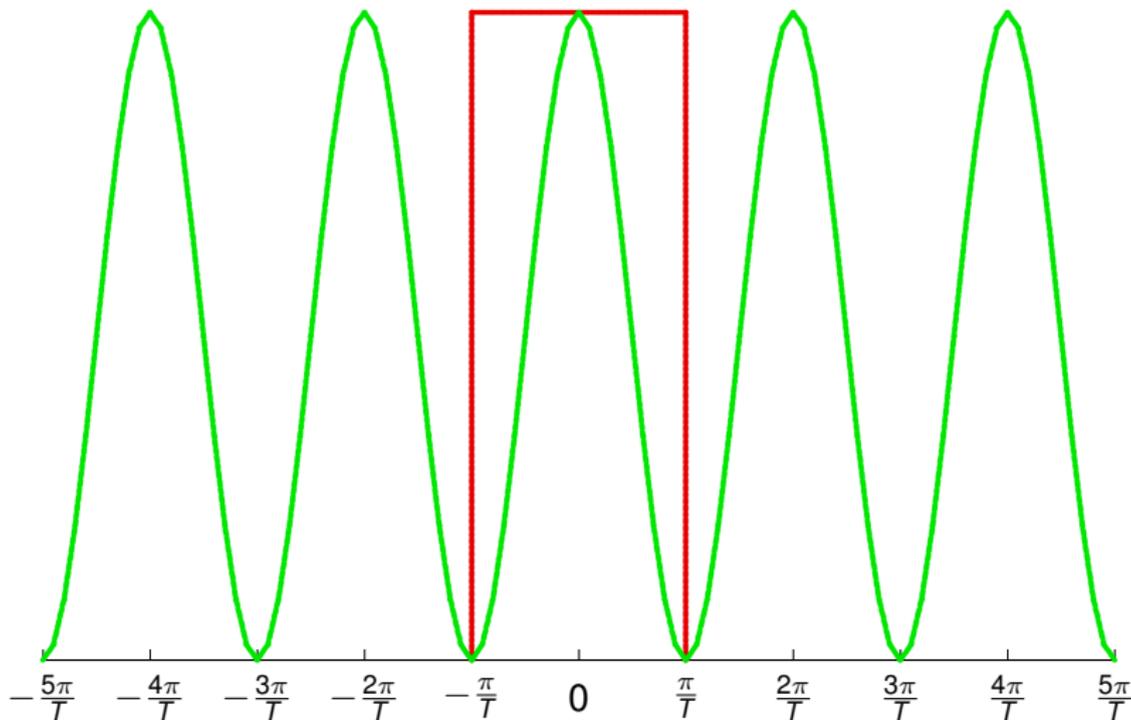
Densidad espectral de potencia con $g_a(t)$



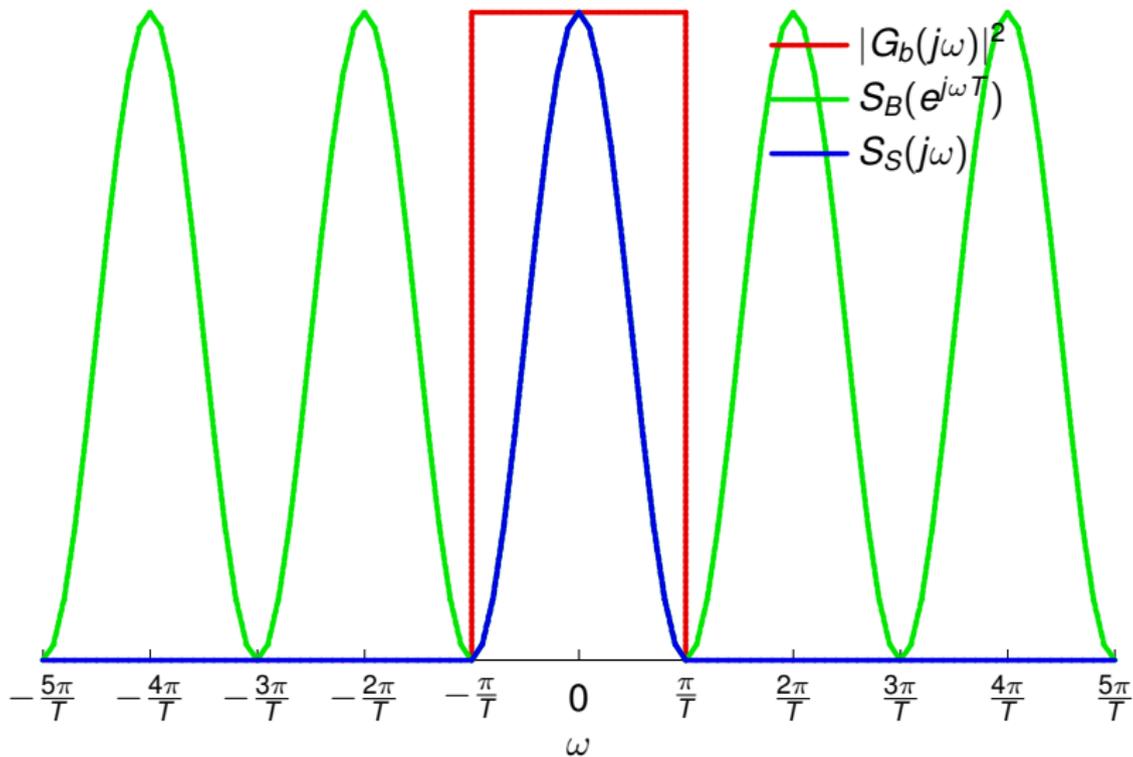
Densidad espectral de potencia con $g_b(t)$



Densidad espectral de potencia con $g_b(t)$



Densidad espectral de potencia con $g_b(t)$



Densidad espectral de potencia con $g_b(t)$

