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$x(t)$, $C(\tau) = \pi N_0 \delta(\tau)$ $\qquad H(\omega) = \dfrac{1}{1 + j\omega RC}$ (FILTRO RC) $\qquad Y(\omega) = H(\omega) X(\omega)$

$$G_{X_{BIL}}(\omega) = \frac{F[C(\tau)]}{2\pi} = \frac{1}{2\pi} \int_{-\infty}^{+\infty} \pi N_0 \delta(\tau) e^{-j\omega\tau} dt = \frac{N_0}{2}$$

$$G_{X_{MONO}}(\omega) = \begin{cases} 2 G_{X_{BIL}}(\omega) & \omega \geq 0 \\ G_{X_{BIL}} & \omega < 0 \end{cases}$$

$$G_{Y_{BIL}}(\omega) = |H(\omega)|^2 G_{X_{BIL}}(\omega) \qquad |H(\omega)|^2 = \frac{1}{1 + \omega^2 R^2 C^2} \Rightarrow G_{Y_{BIL}}(\omega) = \frac{N_0}{2} \frac{1}{1 + (\omega RC)^2}$$

$$G_{Y_{BIL}}(\omega) = \frac{F[C_y(\tau)]}{2\pi} \Rightarrow F[C_y(\tau)] = 2\pi G_{Y_{BIL}}(\omega) = \cancel{2}\pi \cdot \frac{N_0}{\cancel{2}} \frac{1}{1 + (\omega RC)^2}$$

$$C_y(\tau) = F^{-1}\left[\frac{N_0 \pi}{1 + (\omega RC)^2}\right] = \frac{1}{2\cancel{\pi}} \int_{-\infty}^{+\infty} \frac{N_0 \cancel{\pi}}{1 + \omega^2 (RC)^2} e^{j\omega\tau} d\omega = \frac{1}{4RC} \int_{-\infty}^{+\infty} \frac{2 N_0 RC}{1 + \omega^2 (RC)^2} e^{j\omega\tau} d\omega$$

$$= \frac{N_0}{4RC} e^{-\frac{|\tau|}{RC}} \qquad \left[\text{USANDO IL SUGGERIMENTO: } F[A e^{-\frac{|t|}{t_0}}] = \frac{2 A t_0}{1 + \omega^2 t_0^2}\right]$$

$$P_y = C_y(0) = \frac{N_0}{4RC} e^{-\frac{0}{RC}} = \frac{N_0}{4RC}$$