

TAREA SEMANAL 71) ES2 "GUÍA FILTROS DIGITALES"

BUTTER ORDER 2 ; $F_c = 1 \text{ KHz}$; $F_b(z) = K \frac{1-z^{-1}}{1+z^{-1}}$

$$T(s) = \frac{\omega_0^2}{s^2 + \frac{\omega_0}{Q}s + \omega_0^2} ; T(s) \Big|_{-s = F_b(z)} = T(z)$$

$$T(z) = \frac{\omega_0^2}{\left(\frac{z-1}{z+1}\right)^2 K^2 + \frac{\omega_0}{Q} \frac{z-1}{z+1} K + \omega_0^2} \Rightarrow T(z) = \frac{\omega_0^2 (z+1)^2}{K^2 (z-1)^2 + \frac{\omega_0}{Q} (z-1)(z+1) K + \omega_0^2 (z+1)^2}$$

$$T(z) = \frac{\omega_0^2 (z^2 + 2z + 1)}{K^2 (z^2 - 2z + 1) + \frac{\omega_0}{Q} (z^2 - 1) K + \omega_0^2 (z^2 + 2z + 1)} \Rightarrow T(z) = \frac{\omega_0^2 z^2 + 2\omega_0^2 z + \omega_0^2}{\left(K^2 + \frac{\omega_0}{Q} + \omega_0^2\right) z^2 + (2\omega_0^2 - 2K) z + \left(K^2 - \frac{\omega_0}{Q} K + \omega_0^2\right)}$$

$$T(z) = \frac{\omega_0^2 z^2 + 2\omega_0^2 z + \omega_0^2}{\left(K^2 + \frac{\omega_0}{Q} + \omega_0^2\right) z^2 + (2\omega_0^2 - 2K) z + \left(K^2 - \frac{\omega_0}{Q} K + \omega_0^2\right)} ; K = 2FS$$

ESTO ES PARA CADA CASO