(SAIF K. MOHAMMED)

Filtering in passband is equivalent to filtering in baseband.

Proof:

$$y_p(t) = \int h_p(\tau) x_p(t-\tau) d\tau \qquad \text{—(1)}$$

$y_p(t)$, $h_p(t)$ and $x_p(t)$ are band-limited passband signals.

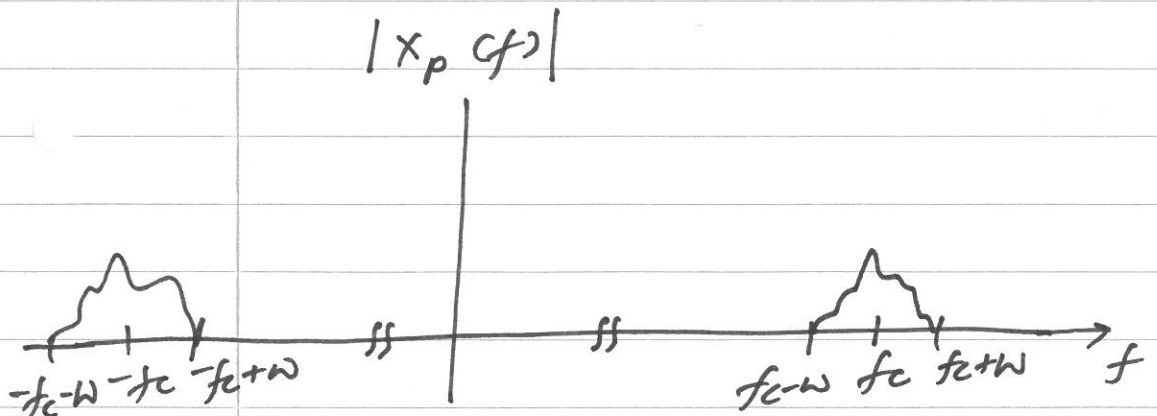
Using the complex baseband representation of these signals we have

$$h_p(\tau) = h^I(\tau) \cos 2\pi f_c \tau - h^Q(\tau) \sin 2\pi f_c \tau.$$

$$x_p(t) = x^I(t) \cos 2\pi f_c t - x^Q(t) \sin 2\pi f_c t.$$

and

$$y_p(t) = y^I(t) \cos 2\pi f_c t - y^Q(t) \sin 2\pi f_c t. \qquad \text{—(2)}$$



we assume that- $f_c > W$.