reconstruction filter, $g(r)$ **, with the window function ,** $W(z)$

$$g(r) = \int_{-\infty}^{\infty} W(z) \cdot |\, z \,| \cdot \exp(\, 2 \cdot \pi \cdot i \cdot r \cdot z \,)\, dz$$

$$= 2 \cdot \int_{0}^{\infty} W(z) \cdot z \cdot \cos(\, 2 \cdot \pi \cdot r \cdot z \,)\, dz \qquad \text{when } W(z) \text{ is the even function of } z$$

band pass Ramachandran filter , $g_R(r)$

$$W(z) = \begin{cases} 1 & 0 \le z_1 \le |\, z \,| \le z_2 \le z_N \\ 0 & \text{others} \end{cases}$$

$$g_R(r) = 2 \cdot \int_{z_1}^{z_2} z \cdot \cos(\, 2 \cdot \pi \cdot r \cdot z \,)\, dz$$

$$= \begin{cases} [\, z^2 \,]_{z_1}^{z_2} & r = 0 \\ 2 \cdot [\, H(\, 2 \cdot \pi \cdot r , z \,) \,]_{z_1}^{z_2} & \text{others} \end{cases}$$

band pass Shepp filter , $g_S(r)$

$$W(z) = \begin{cases} \sin\left(\dfrac{\pi}{2} \cdot \dfrac{z}{z_N} \right) / \left(\dfrac{\pi}{2} \cdot \dfrac{z}{z_N} \right) & 0 \le z_1 \le |\, z \,| \le z_2 \le z_N \\ 0 & \text{others} \end{cases}$$

$$g_S(r) = \frac{4 \cdot z_N}{\pi} \cdot \int_{z_1}^{z_2} \sin\left(\frac{\pi}{2} \cdot \frac{z}{z_N} \right) \cdot \cos(\, 2 \cdot \pi \cdot r \cdot z \,)\, dz$$

$$= \frac{1}{\Pi} \cdot [\, I(\, 2 \cdot \pi \cdot r - \Pi , z \,) - I(\, 2 \cdot \pi \cdot r + \Pi , z \,) \,]_{z_1}^{z_2} \qquad \text{when } r \ne \pm \tfrac{1}{2} \cdot \frac{\Pi}{\pi}$$

band pass Chesler filter , $g_C(r)$

$$W(z) = \begin{cases} \tfrac{1}{2} \cdot \left(1 + \cos\left(\pi \cdot \dfrac{z}{z_N} \right) \right) & 0 \le z_1 \le |\, z \,| \le z_2 \le z_N \\ 0 & \text{others} \end{cases}$$

$$g_C(r) = \int_{z_1}^{z_2} \left(1 + \cos\left(\pi \cdot \frac{z}{z_N} \right) \right) \cdot z \cdot \cos(\, 2 \cdot \pi \cdot r \cdot z \,)\, dz$$

$$= \begin{cases} [\, \tfrac{1}{2} \cdot z^2 + H(\, 2 \cdot \Pi , z \,) \,]_{z_1}^{z_2} & r = 0 \\ [\, \tfrac{1}{4} \cdot z^2 + H(\, 2 \cdot \Pi , z \,) + \tfrac{1}{2} \cdot H(\, 4 \cdot \Pi , z \,)]_{z_1}^{z_2} & r = \pm \dfrac{\Pi}{\pi} \\ [\, \tfrac{1}{2} \cdot (\, H(\, 2 \cdot (\, \pi \cdot r - \Pi \,) , z \,) + H(\, 2 \cdot (\, \pi \cdot r + \Pi \,) , z \,) \,) + H(\, 2 \cdot \pi \cdot r , z \,) \,]_{z_1}^{z_2} & \text{others} \end{cases}$$

where

z_N : Nyquist frequency ($z_N = \tfrac{1}{2}$ when r is the integer)

$$\Pi = \frac{\pi}{2 \cdot z_N} \quad (\, \Pi = \pi \text{ when } r \text{ is the integer} \,)$$

$$I(\, t , z \,) = \frac{\cos(\, t \cdot z \,)}{t}$$

$$H(\, t , z \,) = \frac{I(\, t , z \,) + z \cdot \sin(\, t \cdot z \,)}{t}$$