$$[P] = -\omega^{-1}\mathcal{E}_z \ (m=0) \quad = \tfrac{1}{2}\rho\left[i(M_{zy}-M_{yz}) \pm (M_{xz}-M_{zx})\right] \quad m=\pm 1$$

$$[S] = \tfrac{1}{2}\rho\left[(M_{xx}+M_{yy}) - \rho M_{zz}(1-2\beta^2/\alpha^2)\right] \ (m=0)$$

$$= \tfrac{1}{2}\omega^{-1}(\mp\mathcal{E}_x + i\mathcal{E}_y) \ (m=\pm 1)$$

$$[T] = \tfrac{1}{2}\rho(M_{xy}-M_{yx}) \ (m=0) = \tfrac{1}{2}\omega^{-1}(i\mathcal{E}_x \pm \mathcal{E}_y) \ (m=\pm 1)$$

$$[\ \ ] = \tfrac{1}{4}\rho\left[\pm i(M_{xx}-M_{yy}) + (M_{xy}+M_{yx})\right] \quad m=\pm 2$$

$$f_j = \mathcal{E}_j\,\delta(x-x_s) - \partial_k M_{jk}\,\delta(x-x_s)$$

Horizontal transforms get rid of $\delta(x)\,\delta(y)$ dependencies but not z. This leaves force in form below.

$$[u] = M_{zz}/(\rho\alpha^2) \quad m=1$$

$$[v] = \tfrac{1}{2}(\pm M_{xz} - iM_{yz})/(\rho\beta^2) \quad m=\pm 1$$

$$[w] = \tfrac{1}{2}(\mp M_{yz} - iM_{xz})/(\rho\beta^2) \quad m=\pm 1$$

$$b(z) = P(z, z_0)\, b(z_0)$$

$$b_0 = P(z_0, z)\, b(z) = P^{-1}(z, z_0)\, b(z)$$

$$\partial_z b(z) - \omega A(z)\, b(z) = 0$$

$\times\, P^{-1}(z, z_0)$

$$P^{-1}(z,z_0)\,\partial_z b(z) - \omega P^{-1}(z,z_0) A(z) b(z) = 0$$

$$\frac{\partial}{\partial z}\left(P^{-1}(z,z_0)\, b(z)\right) = \frac{\partial}{\partial z}\left(P(z_0,z)\, b(z)\right) = \frac{\partial}{\partial z} b(z_0) = 0$$

so

$$P^{-1}(z,z_0)\,\partial_z b(z) + \left(\frac{\partial}{\partial z}P^{-1}(z,z_0)\right) b(z) = 0$$

$\therefore$

$$-\left(\frac{\partial}{\partial z} P^{-1}(z,z_0)\right) b(z) = \omega P^{-1}(z,z_0) A(z)\, b(z)$$

$$\partial_z P^{-1}(z,z_0) = -\omega P^{-1}(z,z_0) A(z)$$

now consider

$$\partial_z b(z) - \omega A(z)\, b(z) = F(z)$$

pgs 94-96, 43-44

See Kennett's Book (1983) pgs 94-96, 4.

$$\partial_z P^{-1}(z,z_0) = -\omega P^{-1}(z,z_0) A(z)$$

=

now consider

$$\partial_z b(z) - \omega A(z) b(z) = F(z)$$

$$P^{-1}(z,z_0) \frac{\partial}{\partial z} b(z) - \omega P^{-1}(z,z_0) A(z) b(z) = P^{-1}(z,z_0) F(z)$$

$$P^{-1}(z,z_0) \frac{\partial}{\partial z}(b(z)) + \left[\frac{\partial}{\partial z} P^{-1}(z,z_0)\right] b(z) = P^{-1}(z,z_0) F(z)$$

$$\partial_z \left(P^{-1}(z,z_0) b(z) \right) = P^{-1}(z,z_0) F(z)$$

$$P^{-1}(z,z_0) b(z) = \underset{= b_0}{C} + \int_{z_0}^{z} P^{-1}(z',z_0) F(z')\, dz'$$

$C = b_0$ examine limit $z = z_0$

$\therefore b_0 = C + 0$

$$b(z) = P(z,z_0) b_0 + P(z,z_0) \int_{z_0}^{z} P^{-1}(z',z_0) F(z')\, dz'$$

$$b(z) = P(z,z_0) b_0 + \int_{z_0}^{z} P(z,z_0) P(z,z') F(z')\, dz'$$

$\downarrow$

$$b(z) = P(z,z_0) b_0 + \int_{z_0}^{z} P(z,z') F(z')\, dz'$$

$I(z)$

$$F(z) = F_1 \delta(z - z_s) + F_2 \delta'(z - z_s)$$

[illegible]

See Rennett's Book

$$\partial_z \left(P^{-1}(z,z_0)\, b(z) \right) = P^{-1}(z,z_0)\, F(z)$$

$$P^{-1}(z,z_0)\, b(z) = \underset{= b_0}{C} + \int_{z_0}^{z} P^{-1}(z',z_0)\, F(z')\, dz'$$

$C = b_0$ examine limit $z \to z_0$

$b_0 = C + 0$

$$b(z) = P(z,z_0)\, b_0 + P(z,z_0) \int_{z_0}^{z} P^{-1}(z',z_0)\, F(z')\, dz'$$

$$b(z) = P(z,z_0)\, b_0 + \int_{z_0}^{z} P(z,z_0)\, P(z_0,z')\, F(z')\, dz'$$

$$b(z) = P(z,z_0)\, b_0 + \underbrace{\int_{z_0}^{z} P(z,z')\, F(z')\, dz'}_{I(z)}$$

$$F(z) = F_1\, \delta(z - z_s) + F_2\, \delta'(z - z_s)$$

$$I(z) = \int_{z_0}^{z} P(z,z') \left[F_1\, \delta(z'-z_s) + F_2\, \delta'(z'-z_s) \right] dz'$$

source equivalent to jump in motion-stress vector.

$$= \begin{cases} 0 & z < z_s \\ P(z,z_s) F_1 - \left(\partial_{z'} P(z,z')\right)\Big|_{z'=z_s} F_2 & z > z_s \end{cases}$$

$$I(z_s) = I F_1 - \left[\partial_{z'} P(z_s,z') \right]_{z'=z_s} F_2$$

$$= F_1 + \omega A(z_s) F_2$$

$$P(z_s,z') = P^{-1}(z',z_s)$$

$$\partial_{z'} P(z_s,z') = \partial_{z'} P^{-1}(z',z_s)$$

$$= -\omega P^{-1}(z_s,z')\, A(z_s)$$

$$= -\omega I A(z_s) \quad z'=z_s$$