From Equation (3) and (1) in Sharma we can calculate equation (10b)

$\hat{\gamma} z_2 = ?$

$$\hat{\gamma} z_R = -\frac{1}{2(1+\sigma)} z \frac{\partial \theta_R}{\partial y} + \psi_{R2}$$ equation (16)

R=2

$$\hat{\gamma} z_2 = \frac{-z}{2(1+\sigma)} \cancel{z} \frac{\partial \theta_2}{\partial y} + \psi_{22}$$

$$\hat{\gamma} z_2 = \frac{-z}{2(1+\sigma)} \frac{\partial}{\partial y} \frac{\left(-4A(1+\sigma)\partial^2 V_2\right.}{\partial z^2} + A\frac{\partial^2 V_2}{\partial y \partial z}$$

$$\hat{\gamma} z_2 = \frac{-z}{\cancel{2(1+\sigma)}} \cdot (\cancel{-4})^{2} A \cancel{(1+\sigma)} \frac{\partial^3}{\partial y \partial z^2} V_2 + A\frac{\partial^2 V_2}{\partial y \partial z}$$

$$\hat{\gamma} z_2 = +2Az\frac{\partial^3}{\partial y \partial z^2} V_2 + A\frac{\partial^2 V_2}{\partial y \partial z}$$

diferente da Timpone eq 16b $\neq$ Equation 10b Sharma

Equal

From Equation (3) and (1) in Sharma we can calculate equation 10c

$\hat{z}z_2 = ?$

$$\hat{z}z_R = -\frac{1}{2(1+\sigma)} z \frac{\partial \theta_R}{\partial z} + \psi_{R3}$$

equation 1c

if R=2

$$\hat{z}z_2 = \frac{-1}{2(1+\sigma)} z \frac{\partial \theta_2}{\partial z} + \psi_{23}$$

$$\hat{z}z_2 = \frac{-1}{2(1+\sigma)} z \frac{\partial}{\partial z}[-4A(1+\sigma)]\frac{\partial^2 V_2}{\partial z^2} + \left[-A\frac{\partial^2 V_2}{\partial z^2}\right]$$

$$\hat{z}z_2 = \frac{-z}{\cancel{2(1+\sigma)}}\left[[-\cancel{4}^{2}]A\cancel{(1+\sigma)}\right]\frac{\partial^3 V_2}{\partial^3 z} - A\frac{\partial^2 V_2}{\partial^2 z}$$

$$\hat{z}z_2 = 2Az\frac{\partial^3 V_2}{\partial z^3} - A\frac{\partial^2 V_2}{\partial^2 z}.$$

Igual a equation 16c of Temprone = equation 10c Sharma

Find W_2 of Sharne eq 11
or Timpone eq 19

(19)

$$\frac{\partial W_R}{\partial z} = \frac{1}{E}\left[(1+\sigma) Z Z_R - \sigma \Theta_R\right]$$ Eq 3a

if $R=2$

$$\frac{\partial W_R}{\partial z} = \frac{1}{E}\left[(1+\sigma) \underbrace{Z Z_2 - \sigma \Theta_2}\right]$$

$$\frac{\partial w_2}{\partial z} = \frac{1}{E}\left[(1+\sigma)\left(2Az\frac{\partial^3 V_2}{\partial z^3} - A\frac{\partial^2 V_2}{\partial z^2}\right) - \sigma\, \Theta_2\right]$$

$$\frac{\partial w_2}{\partial z} = \frac{1}{E}\left\{\left[2AZ(1+\sigma)\frac{\partial^3 V_2}{\partial z^3} - A(1+\sigma)\frac{\partial^2 V_2}{\partial^2 z}\right] - \sigma(-4)A(1+\sigma)\frac{\partial^2 V_2}{\partial z^2}\right\}$$

$$\frac{\partial w_2}{\partial z} = \frac{A(1+\sigma)}{E}\left\{\left[2Z\frac{\partial^3 V_2}{\partial z^3} - \frac{\partial^2 V_2}{\partial^2 z}\right] + \sigma 4\,\frac{\partial^2 V_2}{\partial z^2}\right\}$$

$$\frac{\partial w_2}{\partial z} = \frac{A(1+\sigma)}{E}\left[2Z\frac{\partial^3 V_2}{\partial z^3} + (\sigma 4 - 1)\frac{\partial^2 V_2}{\partial z^2}\right]$$

$$\int \frac{\partial w_2}{\partial z} dz = w_2$$

$$w_2 = \frac{A(1+\sigma)}{E}\left[\int 2z\frac{\partial^3 V_2}{\partial z^3}dz \cdot (1-4\sigma)\underbrace{\int \frac{\partial^2 V_2}{\partial z^2}dz}_{\frac{\partial V_2}{\partial z}}\right]$$

$$w_2 = \frac{A(1+\sigma)}{E}\left\{\underbrace{\int 2z\frac{\partial^3 V_2}{\partial z^3}dz}_{\text{integração por partes}} - (1-4\sigma)\frac{\partial V_2}{\partial z}\right\}$$

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Integrar a equação por partes

$$\int u\,dv = uv - \int v\,du$$

$$2\int z \frac{\partial^3 V_2}{\partial z^3}\,dz$$

$u = z$ $\quad dv = \frac{\partial^3}{\partial z^3} V_2\,dz$

$du = dz$ $\quad \int dv = \int \frac{\partial^3}{\partial z^3} V_2\,dz$

$$v = \frac{\partial^2}{\partial z^2} V_2$$

$$2\int z \frac{\partial^3 V_2}{\partial z^3}\,dz = 2\left[uv - \int v\,du \right]$$

$$= 2\left[z \frac{\partial^2}{\partial z^2} V_2 - \int \frac{\partial^2}{\partial z^2} V_2\,dz \right]$$

$$2\int z \frac{\partial^3 V_2}{\partial z^3}\,dz = 2\left[z \frac{\partial^2 V_2}{\partial z^2} - \frac{\partial V_2}{\partial z} \right]$$

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$$W_2 = \frac{A(1+\sigma)}{E}\left\{ 2\int z \frac{\partial^3 V_2}{\partial z^3} dz - \frac{\partial V_2}{\partial z} + 4\sigma \frac{\partial V_2}{\partial z} \right\}$$

$$W_2 = \frac{A(1+\sigma)}{E}\left\{ 2z\frac{\partial^2 V_2}{\partial z^2} - 2\frac{\partial V_2}{\partial z} - \frac{\partial V_2}{\partial z} + 4\sigma \frac{\partial V_2}{\partial z} \right.$$

$$W_2 = \frac{A(1+\sigma)}{E}\left\{ 2z\frac{\partial^2 V_2}{\partial z^2} - 3\frac{\partial V_2}{\partial z} + 4\sigma \frac{\partial V_2}{\partial z} \right\}$$

$$W_2 = \frac{A(1+\sigma)}{E}\left\{ 2z\frac{\partial^2 V_2}{\partial z^2} - (3-4\sigma)\frac{\partial V_2}{\partial z} \right\}$$

$$W_2 = \frac{A(1+\sigma)}{E}\left\{ 2z\frac{\partial^2 V_2}{\partial z^2} - (3-4\sigma)\frac{\partial V_2}{\partial z} \right\}$$

igual Tempone eq 19

≠ eqnas 11 Sharma

Finding u_2 of Sharma (Eq (11)) 22

$u_2 = ?$

$$\frac{\partial u_R}{\partial z} + \frac{\partial w_R}{\partial x} = \frac{2(1+\sigma)}{E}\hat{xz}_R$$

if R=2

$$\boxed{\frac{\partial u_2}{\partial z} + \frac{\partial w_2}{\partial x} = \frac{2(1+\sigma)}{E}\hat{xz}_2}$$

$\hat{xz}_2$ => usei igual a eq. 10 do Shama que eu também Achei.

$$\boxed{\hat{xz}_2 = 2Az\frac{\partial^3 V_2}{\partial x\,\partial z^2} + A\frac{\partial^2 V_2}{\partial x\,\partial z}}$$

w_2 => usei a equação que eu deduzi pag 21. que é igual ao da Tempone eq 19.

$$w_2 = \frac{A(1+\sigma)}{E}\left\{2z\frac{\partial^2 V_2}{\partial z^2} - (3-4\sigma)\frac{\partial V_2}{\partial z}\right\}$$

$$\frac{\partial w_2}{\partial x} = \frac{A(1+\sigma)}{E}\left\{2z\frac{\partial}{\partial x}\frac{\partial^2 V_2}{\partial z^2} - (3-4\sigma)\frac{\partial}{\partial x}\frac{\partial V_2}{\partial z}\right\}$$

Substituindo os termos e integrado em z

$\cancel{\frac{\partial u_2}{\partial z}}$ $\cancel{E}$

$$\frac{\partial u_2}{\partial z} + \frac{\partial w_2}{\partial x} = \frac{2(1+\sigma)}{E} \hat{x} z_2 .$$

$$\frac{\partial u_2}{\partial z} + \overbrace{\frac{A(1+\sigma)}{E} \left\{ \underbrace{2z \frac{\partial}{\partial x} \frac{\partial^2 V^2}{\partial z^2}}_{I_1} - (3-4\sigma) \underbrace{\frac{\partial}{\partial x} \frac{\partial}{\partial z} V_2}_{I_2 = I_4} \right\}} =$$

$$2\frac{\cancel{A}(1+\sigma)}{E} \left\{ \overbrace{\frac{2\cancel{A} z \partial \partial^3 V_2}{\partial_x \partial z^2}}^{I_3} + \frac{\cancel{A} \, \partial^2 V_2}{\partial x \partial z} \right\}$$

Integrando as equações $u \sim z$.

$$\int \frac{\partial u_2}{\partial z} dz = u_2 .$$

$$2\int z \frac{\partial}{\partial x} \frac{\partial^2 V^2}{\partial \cancel{z}^2} dz = 2 I_1 = 2 I_3$$

integral por parte $\int u \, dv = uv - \int v \, du$

$u = z$
$du = dz$

$$dV = \frac{\partial^3 V^2}{\partial x \partial z^2} dz$$

$$\int dv = \int \frac{\partial^3 V^2}{\partial x \partial z^2} dz$$

$$v = \frac{\partial V_2}{\partial x \partial z}$$

$$I_1 = I_3 = z \frac{\partial V_2}{\partial x \partial z} - \int \frac{\partial V_2 \, dz}{\partial x \partial z}$$

$$I_1 = I_3 = \frac{z \, \partial V_2}{\partial x \partial z} - \frac{\partial V_2}{\partial x}$$

$$2\int \frac{z \, \partial^2 V_2}{\partial x \partial z^2} dz = \frac{2 z \partial V_2}{\partial x \partial z} - 2\frac{\cancel{\partial} V_2}{\partial x}$$

Integral $I_2 = I_4 = \int \frac{\partial}{\partial x} \frac{\partial}{\partial z} V_2 \, dz = \frac{\partial V_2}{\partial x}$

Usando as integrais $I_1 I_2 I_3$ e I_4. (24)

$$\int \frac{\partial u_2}{\partial z} dz + \frac{A(1+\sigma)}{E}\left\{ \underbrace{2\int z \frac{\partial}{\partial x}\frac{\partial^2 V_2}{\partial z^2} dz}_{I_1} - (3-4\sigma)\underbrace{\int \frac{\partial}{\partial x}\frac{\partial V_2}{\partial z} dz}_{I_2} \right.$$

$$= \frac{2A(1+\sigma)}{E}\left\{ \underbrace{2\int z \frac{\partial}{\partial x}\frac{\partial^2 V_2}{\partial z^2} dz}_{I_3} + \underbrace{\int \frac{\partial^2 V_2}{\partial x \partial z} dz}_{I_4} \right.$$

$$u_2 + \frac{A(1+\sigma)}{E}\left\{ \overbrace{\left[2z\frac{\partial V_2}{\partial x \partial z} - 2\frac{\partial V_2}{\partial x} \right]}^{I_1} - (3-4\sigma)\overbrace{\frac{\partial V_2}{\partial x}}^{I_2} \right\}$$

$$= \frac{2A(1+\sigma)}{E}\left\{ \overbrace{\left[2z\frac{\partial V_2}{\partial x \partial z} - 2\frac{\partial V_2}{\partial x} \right]}^{I_3} + \overbrace{\frac{\partial V_2}{\partial x}}^{I_4} \right\}$$

$$u_2 = \frac{A(1+\sigma)}{E}\left\{ \left[2z\frac{\partial V_2}{\partial x \partial z} - \cancel{2\frac{\partial V_2}{\partial x}} \right] + (3-4\sigma)\frac{\partial V_2}{\partial x} + \cancel{\frac{2\partial V_2}{\partial x}} \right\}$$

$$u_2 = \frac{A(1+\sigma)}{E}\left\{ 2z\frac{\partial^2 V_2}{\partial x \partial z} + (3-4\sigma)\frac{\partial V_2}{\partial x} \right\}$$

Finding v_2 analong to u_2 25

$$v_2 = \frac{A(1+\sigma)}{E}\left\{2z\frac{\partial V_2}{\partial y\,\partial z} + (3-4\sigma)\frac{\partial V_2}{\partial y}\right\}$$