[illegible] 539.3

[illegible]

[illegible]

[illegible] (1) [illegible]

$$\nabla^2 u_i + \frac{1}{1-2\nu}\frac{\partial\theta}{\partial x_i} + \frac{2\nu}{1-2\nu}\theta\frac{\partial \ln E}{\partial x_i} + \frac{\partial \ln E}{\partial x_j}\left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i}\right) = 0 \quad (3)$$

[illegible] σ [illegible] $\boldsymbol{\varepsilon}$ [illegible] [2].

[illegible] $E = E(T)$, $\nu = const$ [illegible] $\alpha = \alpha(T)$ [illegible]:

$$\nabla^2 u_i + \frac{1}{1-2\nu}\frac{\partial\theta}{\partial x_i} - \frac{2(1+\nu)}{1-2\nu}\frac{\partial}{\partial x_i}\left(\int_0^T \alpha(T)dt\right) + \frac{1}{E}\frac{\partial E}{\partial x_j}\left[\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} + \frac{2\nu}{1-2\nu}\theta\delta_{ij} - \frac{2(1+\nu)}{1-2\nu}\int_0^T \alpha(T)dt\,\delta_{ij}\right] = 0; \quad (4)$$

$$\left[\frac{1}{2}\left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i}\right) + \frac{\nu}{1-2\nu}\theta\delta_{ij}\right]n_j = \frac{1+\nu}{E}q_i(x_S) + \frac{1+\nu}{1-2\nu}n_i\int_0^T \alpha(T)dT. \quad (5)$$

[illegible] [3] [illegible] χ, [illegible] $\frac{1}{E}\frac{\partial E}{\partial x_j} = \frac{1}{E}\frac{dE}{dT}\frac{\partial T}{\partial x_j} = \chi Q(T)\frac{\partial T}{\partial x_j} = \chi B_j$, [illegible] (1) [illegible]:

$$\nabla^2 u_i + \frac{1}{1-2\nu}\frac{\partial\theta}{\partial x_i} - \frac{2(1+\nu)}{1-2\nu}\frac{\partial}{\partial x_i}\left(\int_0^T \alpha(T)dt\right) + \chi B_j\left[\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} + \frac{2\nu}{1-2\nu}\theta\delta_{ij} - \frac{2(1+\nu)}{1-2\nu}\int_0^T \alpha(T)dt\,\delta_{ij}\right] = 0. \quad (6)$$

[illegible] (4), (5) [illegible] (4), (5) [illegible] (2), (3)).

[illegible] χ

$$u_i = u_i^0 + \sum_{k=1}^{\infty}\chi^k u_i^k. \quad (7)$$

[illegible] (7) [illegible] (6) [illegible] (5), [illegible] u_i^0:

[illegible] u_i [illegible] $i = 1, 2, 3$), [illegible] V [illegible]

$$(\lambda+\mu)\frac{\partial\theta}{\partial x_i} + \mu\nabla^2 u_i + \theta\frac{\partial\lambda}{\partial x_i} + \frac{\partial\mu}{\partial x_i} + \rho F_i = 0 \quad (1)$$

[illegible]

$$\left[\lambda\frac{\partial u_k}{\partial x_k}\delta_{ij} + \mu\left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i}\right)\right]n_j = q_i(x_S). \quad (2)$$

[illegible] λ [illegible] μ – [illegible], $\lambda = \frac{\nu E}{(1+\nu)(1-2\nu)}$,

$\mu = G = \frac{E}{2(1+\nu)}$, $\boldsymbol{\varepsilon}$ – [illegible], ν – [illegible], $\theta = \frac{\partial u_k}{\partial x_k}$ – [illegible]

n_j – [illegible] $q_i(x_S)$ – [illegible], ρ – [illegible], F_i – [illegible]

[illegible] $\nu = const(\neq 0{,}5)$, $E = E(x_S)$. [illegible]

[illegible] 2000. [illegible], 267.

$$\nabla^2 u_i^0 + \frac{1}{1-2\nu}\frac{\partial\theta^0}{\partial x_i} = \frac{2(1+\nu)}{1-2\nu}\frac{\partial}{\partial x_i}\left(\int_0^T \alpha(T)dt\right),$$

$$-\left[\frac{1}{2}\left(\frac{\partial u^\circ_i}{\partial x_j}+\frac{\partial u^\circ_j}{\partial x_i}\right)+\frac{\nu}{1-2\nu}\theta\delta_{ij}\right]n_i = \qquad (8)$$

$$= \frac{1+\nu}{E}q_i(x_S) + \frac{1+\nu}{1-2\nu}n_i\int_0^T \alpha(T)dt$$

[illegible] u_i^k, $k = 1,2,...$

$$\nabla^2 u_i^k + \frac{1}{1-2\nu}\frac{\partial\theta^k}{\partial x_i} = -B_j\left[\frac{\partial u_i^{k-1}}{\partial x_j}+\frac{\partial u_j^{k-1}}{\partial x_i}+\frac{2\nu}{1-2\nu}\theta^{-1}\delta_{ij}\right], \qquad (9)$$

$$\left[\frac{1}{2}\left(\frac{\partial u_i^k}{\partial x_j}+\frac{\partial u_j^k}{\partial x_i}\right)+\frac{\nu}{1-2\nu}\theta\delta_{ij}\right]n_j = 0.$$

[illegible]

$$\sigma_{ij} = \frac{E(T)}{1+\nu}\times$$

$$\times\left\{\left[\frac{1}{2}\left(\frac{\partial u_i^0}{\partial x_j}+\frac{\partial u_j^0}{\partial x_i}\right)+\frac{\nu}{1-2\nu}\frac{\partial u_k^0}{\partial x_k}\delta_{ij}-\frac{1+\nu}{1-2\nu}\int_0^T\alpha(T)dt\,\delta_{ij}\right]+ \qquad (10)\right.$$

$$\left.\sum_{k=1}^{\infty}\chi^k\left[\frac{1}{2}\left(\frac{\partial u_i^k}{\partial x_j}+\frac{\partial u_j^k}{\partial x_i}\right)+\frac{\nu}{1-2\nu}\frac{\partial u_k}{\partial x_k}\delta_{ij}\right]\right\}.$$

[illegible]

[illegible] (u_i^0), [illegible] [4].

[illegible]

$$2\pi T(x) = \int_S\left(\frac{dT}{dn_y}\frac{1}{r}+T(y)\frac{\cos\varphi}{r^2}\right)dS_y, \qquad (11)$$

[illegible] $r = |y-x|$, x – [illegible] y - [illegible], $\cos\varphi$ – [illegible] $\bar{r}$ [illegible] n_y.

[illegible] (8) [illegible]:

$$u_i^0 = u_i^u + u_i^T, \qquad (12)$$

[illegible] u_i^u – [illegible], [illegible] u_i^T [illegible]

$$u_i^T = \frac{\partial W}{\partial x_i}. \qquad (13)$$

[illegible] [8] [illegible]

$$\sigma_{ij}^0 = \sigma_{ij}^u + \sigma_{ij}^T. \qquad (14)$$

[illegible] σ_{ij}^u [illegible] u_i^u, [illegible] σ_{ij}^T – [illegible] u_i^T.

[illegible] (8) [illegible] (13) [illegible]

$$\Delta W = \frac{1+\nu}{1-\nu}\int_0^T\alpha(T)dT. \qquad (15)$$

[illegible]

$$\alpha(T) = \alpha_0(1+\gamma T), \qquad (16)$$

[illegible] α_0 – [illegible], γ – [illegible]

$$\Delta W = a\left(T + \frac{T^2}{2}\gamma\right), \qquad (17)$$

[illegible] $a = \alpha_0\frac{1+\nu}{1-\nu}$.

[illegible]

$$\lambda(T) = \lambda_0(1-kT), \qquad (18)$$

λ_0 – [illegible], k – [illegible]

[illegible] (18) [illegible] T^*

$$T = \frac{1}{k}\left(1-\sqrt{1-\frac{2k}{\lambda_0}T^*}\right). \qquad (19)$$

[illegible] (19) [illegible] (17) [illegible]

$$\Delta W = abT - acT^*. \qquad (20)$$

[illegible] $b = 1+\frac{\gamma}{k}; c = \frac{\gamma}{k\lambda_0}$.

[illegible] T^* [illegible]

$$\Delta W = -\frac{ab}{4\pi}\int_V T(y)\Delta\left(\frac{1}{r}\right)dV_y - \frac{ac}{4\pi}\int_S\frac{dT^*}{dn_y}\Delta\left(\frac{r}{2}\right)+T^*(y)\Delta\left(\frac{\cos\varphi}{2}\right)dS_y. \qquad (21)$$

[illegible]

$$W = -\frac{ab}{4\pi}\int_V T(y)\frac{1}{r}dV_y - \frac{ac}{4\pi}\int_S\left[\frac{dT^*}{dn_y}\left(\frac{r}{2}\right)-T^*(y)\frac{\cos\varphi}{2}\right]dS_y \qquad (22)$$

[illegible] (13) [illegible]

[illegible]:

$$u_i^T(x) = -\frac{ab}{4\pi}\int_V T(y)\frac{\beta_i}{r^2}dV_y - \frac{ac}{8\pi}\int_S\left[\frac{dT^*}{dn_y}\beta_i + T^*(y)\frac{1}{r}(\beta_i\cos\varphi - n_i(y))\right]dS_y, \qquad (23)$$

[illegible] W [illegible] (13) [illegible] [5], [illegible]

$$\sigma_{ij}^T = \frac{E}{1+\nu}\left(\frac{\partial^2 W}{\partial x_i\partial x_j}-\Delta W\delta_{ij}\right). \qquad (24)$$

[illegible]

$$\sigma_{ij}^T(x) = \frac{\alpha_0 E}{1-\nu}\left\rangle 4\pi T(x)\delta_{ij} - \frac{b}{4\pi}\int_V T(y)\frac{3\beta_i\beta_j-\delta_{ij}}{r^3}dV_y + \frac{C}{8\pi}\int_S\left\{\frac{dT^*}{dn_y}\left(-\frac{\beta_i+\delta_{ij}}{r}\right)+T^*(y)\frac{1}{r^2}\left[n_i(y)\beta_j+n_j(y)\beta_i - 3\beta_i\beta_j\cos\varphi-\cos\varphi\delta_{ij}\right]\right\}dS_y\right\langle. \qquad (25)$$

[illegible] S [illegible]

$$\sigma^T_{ij}(x)_S = \frac{\alpha_0 E}{1-\nu}$$

$$\left\langle -\frac{b}{2\pi}\left\{4\pi T(x)\left[\delta_{ij} - \frac{n_i(x)n_j(x)}{2}\right] + \int_V T(y)\frac{3\beta_i\beta_j - \delta_{ij}}{r^3}dV_y\right\} + \right.$$

$$+\frac{C}{8\pi}\left\{\left[2\pi n_i(x)n_j(x) - 2\pi\delta_j\right]T^*(x) + \right.$$

$$+\int_S\left[\frac{dT^*}{dn}\left(-\frac{\beta_i+\delta_{ij}}{r}\right) + T^*(y)\frac{1}{r^2}\left(n_i(y)\beta_j + \right.\right.$$

$$+\frac{C}{8\pi}\left\{\left[2\pi n_i(x)n_j(x) - 2\pi\delta_j\right]T^*(x) + \right.$$

$$+\int_S\left[\frac{dT^*}{dn}\left(-\frac{\beta_i+\delta_{ij}}{r}\right) + T^*(y)\frac{1}{r^2}\left(n_i(y)\beta_j + \right.\right.$$

$$\left.\left.\left. + n_j(y)\beta_i - 3\beta_i\beta_j\cos\varphi - \cos\varphi\,\delta_{ij}\right)\right]dS_y\right\}\rangle. \quad (26)$$

[illegible] σ^u_{ij} [illegible] [4]

[illegible] σ^T_{ij} [illegible]

$$\rho^T_i(x) = -\sigma^T_{ij}(x)_S \cdot n_j(x), \quad (27)$$

[illegible] [4], [illegible].

$$\nu_i(x) + \frac{1}{4\pi(1+\nu)}\times$$

$$\times\int_S \nu_k(y)\left\{(1-2\nu)\left[\delta_{ik}\cos\psi + n_k(x)\beta_i - n_i(x)\beta_k\right] + \right. \quad (28)$$

$$\left. + 3\beta_i\beta_j\cos\psi\right\}\cdot\frac{1}{r^2}dS_y = p_i(x) + p^T_i(x).$$

[illegible] ν_i - [illegible], $\cos\psi$ - [illegible] $\bar{r}$ [illegible] x, β_{ij} - [illegible] $\rho_i(x)$ - [illegible].

[illegible] (28) [illegible] $\nu_i(x)$, [illegible] σ^u_{ij} [illegible] (14) [illegible] $\sigma^0_{ij}(x)$.

[illegible] u^0_i [illegible] σ^0_{ij} [illegible].

[illegible] (9).

$$\Delta U^k_i + \frac{1}{1-2\nu}\frac{\partial^2 U_j}{\partial x_i \partial x_j} = -\frac{2(1+\nu)}{E^2}\frac{dE}{dT}\frac{\partial T}{\partial x_j}\sigma^0_{ij}. \quad (27)$$

[illegible]

$$u^{(k)}_i = u^u_i + u^N_i, \quad (28)$$

[illegible] u^u_i - [illegible], [illegible] u^N_i - [illegible]

$$u^N_i = -\int_V\left[\frac{2(1+\nu)}{E^2}\frac{dE}{dT}\frac{\partial T}{\partial x_p}\right]U_{ij}dV_y, \quad (29)$$

[illegible] U_{ij} - [illegible]

$$u^N_i = -\frac{(1+\nu)^2}{4\pi(1-\nu)}\int_V\left(\frac{1}{E^2}\cdot\frac{dE}{dT}\cdot\frac{\partial T}{\partial x_p}\cdot\sigma^o_{jp}\right)\cdot$$

$$\frac{3-4\nu\cdot\delta_{ij} - \beta_i\beta_j}{E\cdot r}dV_y. \quad (30)$$

[illegible]

$$\sigma^{(k)}_{ij} = \sigma^u_{ij} + \sigma^N_{ij}. \quad (31)$$

[illegible] σ^u_{ij} [illegible] u^u_i [illegible] [4].

[illegible] σ^N_{ij} [illegible] (29) [illegible] [5].

$$\sigma^N_{ij}(x) = a_1 E(T)\int_V \rho_k(y)\frac{dE}{dT}\cdot\frac{1}{E^3(T)}$$

$$\left\langle\frac{1}{r^2}\left[(1-2\nu)\cdot\left(\delta_{ik}\beta_j + \delta_{kj}\beta_i - \delta_{ij}\beta_k\right) + 3\beta_i\beta_j\beta_k\right] - \frac{dE}{dT}\cdot\frac{1}{2E^2(T)\cdot r}\cdot\right.$$

$$\left\{\frac{\partial T}{\partial x_i}\left[(3-4\nu)\cdot\delta_{jk} + \beta_j\beta_k\right] + \frac{\partial T}{\partial x_j}\left[(3-4\nu)\cdot\delta_{ik} + \beta_i\beta_k\right] + \right\}_y \quad (32)$$

$$\left.\frac{2}{1-2\nu}\cdot\delta_{ij}\sum_{m=1}^{3}\frac{\partial T}{\partial x_m}\left[(3-4\nu)\cdot\delta_{mk} + \beta_m\beta_k\right]\right\}\right\rangle dV,$$

[illegible] $a_1 = \frac{1+\nu}{4\pi(1-\nu)}$; $\rho_k(y) = \frac{\partial T}{\partial x_p}\sigma^o_{pk}$.

[illegible] (32) [illegible] (32) [illegible].

[illegible] $\sigma^N_{ij}(x)$ [illegible] $f^N_i(x)$

$$f^N_i(x) = -\sigma^N_{ij}(x)\cdot n_j,$$

[illegible] (18) [illegible] $f_i(x)$. [illegible]

[illegible]

[illegible]

[illegible]

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