Hyperelastic material:

It's an elastic material that whose internal energy density depends on F

objectivity General electic T = G(F) $\longrightarrow T = FG(C)F^{\dagger}$ hyperelastic Matanal $e = \tilde{e}(F)$ $\longrightarrow e = \tilde{e}(C')$

19 F de Ft: D = T: D

to prove the S

Sterl with Balance of home moneulum

DP = Forface + Fordy (39R)

Ergary = Sting day + Spbdry Jan dy = Sdiv Toly + Sphdy (9 5 - div T - pb) dy =0

2 Dr - div T-pb =0

134 orhillary ouse localization

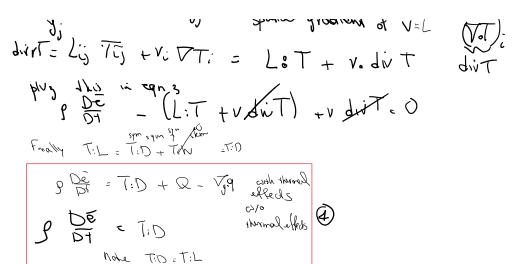
Balance of lin momentum x v -> Turns it to sth similar to bal. of energy

Form the inner product of 1a and v

- V. div T - V. Pb =0

(thermal & electromagnetic effects ignored), equation is first written with thermal terms kept:

CM_Concepts Page 2

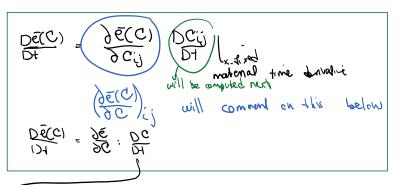


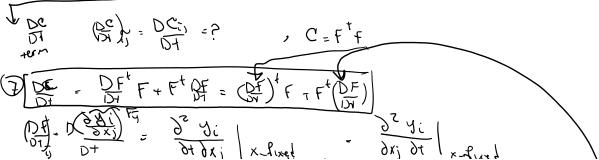
For hyperelastic materials e can be expressed as a function of F

e(F)

But again consider two related observers: $\Rightarrow \quad \textbf{F}^{\bullet}: \checkmark \cancel{J}^{\bullet} \quad \textbf{Q} \quad \checkmark \cancel{J}_{J} : \quad \textbf{QF}$

In this case, e is a scalar value and from y and y* the same e is observed:





CM_Concepts Page 4

plug in egn 9 $(29 F \frac{\sqrt{6}}{80} F^{\dagger}): D = T:D$ (8) $\frac{6}{80}$ $\frac{6}{80}$ (29 F DE FT) = 2P (FT) t DE) + FT = 2F (De) + Ft will duruss how de is calculated and why His sym. (28 F 50 Ft -T): D: O

Sym

A:B=0

B Sym & A is syn them A=0 P A11 A12 A13

A12 A24 A24 A25

A13 A27 A27 B27 B23

A1 B1 4 A22 B22 + A37 B33

A1 B1 4 A22 B22 + A37 B33

A2 A23 A33

A2 A33

A3 B2 A22 B23 = 0 comose B=0 except B=1 - A=0 Similarly A=0 /A==0 - hase = 1 - A==0 /A==0

- Acon

$$T = 2p F \frac{\partial \bar{e}(C)}{\partial C} f^{t}$$

$$= F \left(\frac{29}{3C} \frac{\partial \bar{e}(C)}{\partial C} \right) f^{t} = F \frac{\partial \bar{e}(C)}{\partial C} f^{t}$$

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$$= F \left(\frac{29$$

$$G_{C_1} = \frac{2 \cdot S_0}{\sqrt{\text{det}}C} \frac{\partial \overline{c}}{\partial C_0}$$

$$\frac{\partial C_1}{\partial C_2} = \frac{2 \cdot S_0}{\sqrt{\text{det}}C} \frac{\partial \overline{c}}{\partial C_0}$$

$$\frac{\partial C_2}{\partial C_2} = \frac{2 \cdot S_0}{\sqrt{\text{det}}C} \frac{\partial \overline{c}}{\partial C_0}$$

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Note 1 How is Se computed?

ē(I) , 0

$$\frac{\partial \bar{e}}{\partial c}$$
 =? $(\frac{\partial \bar{e}}{\partial c})_{i}$: $\frac{\partial \bar{e}}{\partial c}$

$$\frac{\partial \vec{e}}{\partial c} = \frac{\partial \vec{e}}{\partial c} = \frac{\partial$$