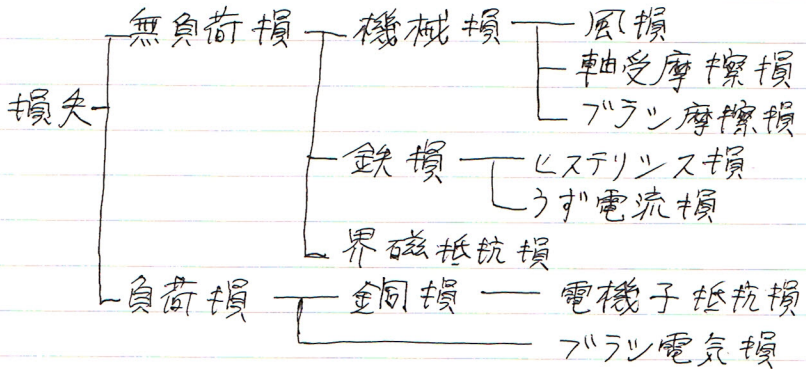


# 第5章 直流機

- 5.1 直流機の電機子反作用
- 5.2 直流機の整流作用
- 5.3 直流電動機の世界制御方法
- 5.4 直流電動機の制動方法



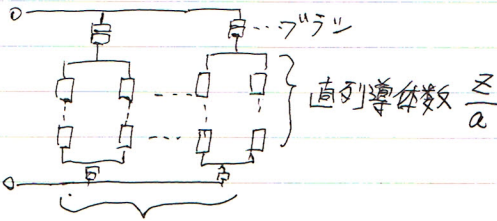
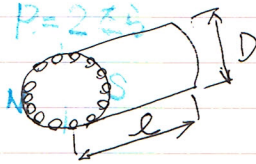
# 直流電動機

導体1本当り

起電力

$$e_a = B \cdot l \cdot v = \frac{\Phi}{\pi D \cdot l} \cdot l \cdot \pi D \frac{N}{60} = P \Phi \frac{N}{60}$$

$$E = e_a \cdot \frac{Z}{a} = \frac{P Z \Phi N}{60 a}$$



並列回路数 a

$a = P$  重ね巻き  
 $a = 2$  波巻き

トルク

導体1本当りに働く力

$$F = B \cdot l \cdot I = \frac{\Phi}{\pi D \cdot l} \cdot l \cdot I = \frac{P \Phi I}{\pi D}$$

$$\text{全トルク } T = F \cdot \frac{D}{2} \cdot \frac{Z}{a} = \frac{P Z \Phi}{2 \pi a} I$$

∠ガット(τ)  
∠ガの回りは 2πa  
(Φ) 子仮付き (I)

三相分の3倍

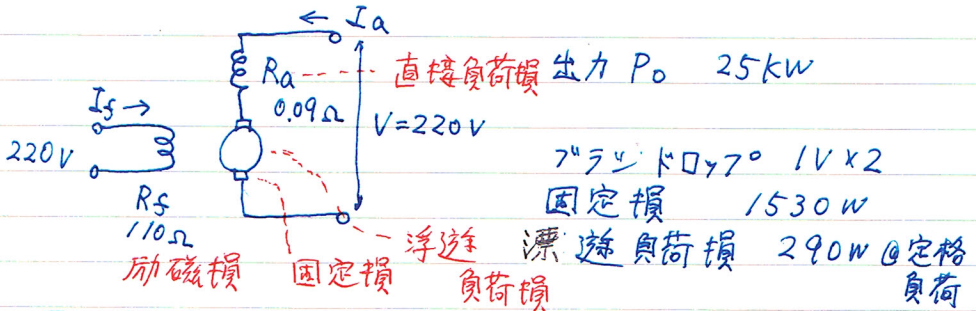
$$E = \frac{P Z}{2 \pi a} \Phi \omega = \frac{P Z}{60 a} \Phi N$$

$$T = \frac{P Z}{2 \pi a} \Phi I$$

KE

KT

# 直流分巻電動機



界磁

$$\text{電流 } I_f = \frac{220\text{V}}{110\Omega} = 2\text{A}$$

$$\text{抵抗損 } P_f = I^2 R = 2^2 \times 110 = 440\text{W}$$

電機子

$$\text{入力} = \text{損失} + \text{出力}$$

$$P_a + P_f = P_o + \text{固定損} + \text{漂遊負荷損} + \text{直接負荷損} + \text{励磁損発生}$$

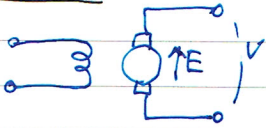
$(\text{励磁損}) \times I$   $(I_a^2 R_a)$   $(P_f)$

$$V I_a + P_f = P_o + P_{\text{固定}} + \text{浮遊} + I_a^2 R_a + P_f$$

$$220 \times I_a + 440 = 25000 + 1530 + 290 + 0.09 I_a^2 + 440$$

$$\text{効率} = \frac{P_o}{P_i} = \frac{25000}{220(130+2)} = 86\% \quad I_a = 130\text{A}$$

[他励]

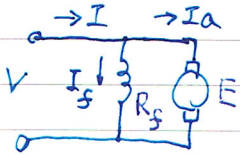


$$E = V - R_a I_a$$

$$E = \frac{PZ}{60a} \phi N = k \phi N$$

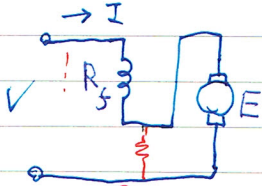
(常数)

[分卷]



$$E = V - R_a (I_a - I_f)$$

[直卷]



$$E = V - (R_a + R_s) I$$

(複内巻)

