

## 研 究 速 報

where  $U$  is a unit matrix. Using the final value theorem of  $z$ -transform,

$$\lim_{n \rightarrow \infty} X(nT) = \lim_{z \rightarrow 1} (1 - z^{-1})X(z) \\ = [U - H(T)^{-1}]X(0) \quad \dots (11)$$

By the above analysis, we can compute  $\lim_{n \rightarrow \infty} X(nT)$ , if the initial conditions  $X(0)$  are given as equation (3). Then currents  $i_d$  and  $i_q$  at arbitrary time can be computed from equation (8). Finally, we can compute output Torque  $T_0$  and input current  $I_0$  of the inverter. They are,

$$T_0 = -(L_d - L_q)i_d i_q - L_{ad} i_f i_q \quad \dots (12)$$

$$I_0 = (v_d i_d + v_q i_q) / V \quad \dots (13)$$

## (4) Numerical Example

The characteristics of the motor tested are shown in Fig. 2~Fig. 4. The motor constants are

shown by Table 1.

In Fig. 2, average torque vs speed curves of the commutatorless motor are shown.

In Fig. 3, torque speed curves in low speed part are shown, and in Fig. 4, wave forms of instantaneous

Table 1 Motor constants

10 kW, 3 Phase
2 Poles
200 V (line to line)
$r_a = 0.1 \Omega$
$L_d = 0.00478 \text{ H}$
$L_q = 0.00287 \text{ H}$
$L_{ad} = 0.187 \text{ H}$

ous torque at angular velocity  $\omega_M = 100\pi(\text{rad/sec})$  are shown.

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ページ	段	行	種 別	正	誤
表紙 2			表紙説明	(本文 p. 18 参照)	脱落
2	右	14	本 文	1964 年新潟地震	1960 年新潟地震
3	左	下 6	"	"	"
"	"		写真説明	"	"
5	右	下 14	文 献	1968 年十勝沖地震	1986 年十勝沖地震
表紙 3			筆者紹介	岡田恒男	岡田恒夫