



DC MACHINE - SMALL

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Abstract—

I. IDLE MODE EXPERIMENT

A. Electric motor force

The machine is operated without (a) load. This way the voltage U_q which is induced in the generator can be measured. The induced voltage is also called electric motor force (EMK).

For this experiment the initial torque 5000rpm will be reduced by 1000rpm each time. At 5000rpm the motor has its maximum voltage $U_A = 11.94V$.

The machine constant c and the magnetic flux Φ_E are experimentally determined (different for each machine)

$$c \cdot \Phi_E = \frac{U_q}{n} = \frac{8.8V}{4000/60s} = 0.132Vs \quad (1)$$

II. LOADED GENERATOR MODE EXPERIMENT

The generator is now operated at 4000rpm.

$n[min^{-1}]$	$EMK[V]$	$U_A[V]$	$I_A[A]$	$c \cdot \varphi_E[V s]$
5000	11.10	11.94	0.420	0.1332
4000	8.80	9.61	0.390	0.1320
3000	6.60	7.30	0.357	0.1320
2000	4.43	5.00	0.327	0.1329
1000	2.20	2.68	0.276	0.1320

Table I: Leerlaufversuch

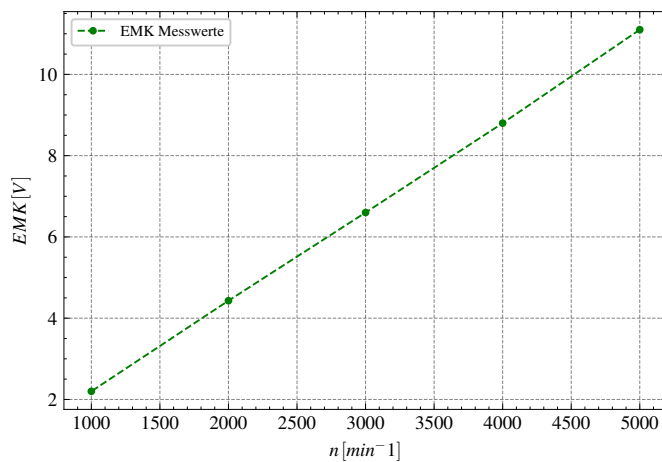


Figure 1: Idle Mode