

Test Bench for Cogging Torque Measurement in PM-Machines

Technical Data

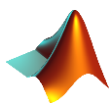
- Cogging torque measurement in a range from 20 mNm up to 10 Nm
- Measurements > 2 Nm with transmission and break

Drive's holding torque	1.98 Nm
Minimum torque resolution	2 mNm
Minimum period of the device under test	10°
Maximum cogging torque of the device under test	0.2 Nm
Number of steps per turn	3200 steps
Number of steps for one cogging torque period	89 steps



Equipment

- Stepper motor: Nanotec PD4-N5918L2404
- Torque measuring shaft: Kistler 4503
- Digital IO System:
 - Serial port: RS 232 (measuring shaft)
 - Serial port: RS 485 (stepper motor)
 - USB: National Instruments 6501
- Control and GUI with MathWorks MATLAB

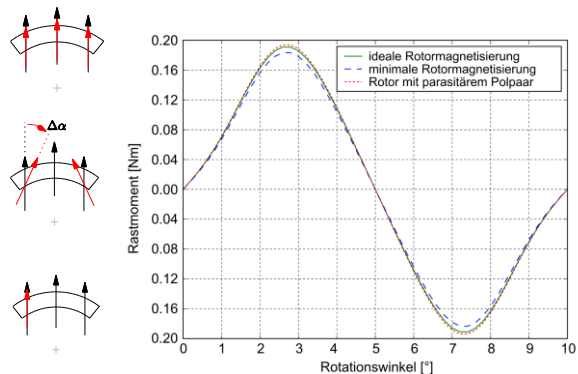


Measurement

Torque	Kistler 4503: 1 Nm / 10 Nm (accuracy class 0.2 / 0.1)
Speed	Kistler 4503: 7000 rpm
Encoder resolution	2*360 impulses, 90° shifted
Motor step size	Up to 0.1125° per step
Temperature	rotor and stator

Application

- DFG research project: Transfer of uncertainties in electromagnetic systems
- Analysis of magnetization deviations' influence on the cogging torque
- 3 different rotors with specific magnetization deviations
- Verification of magnetization models:



Managing Director:
Univ.-Prof. Dr.-Ing. habil. Dr. h. c. Kay Hameyer

Schinkelstraße 4 Phone: +49-241-80-97667
 D-52056 Aachen Fax: +49-241-80-92270
 Homepage: www.iem.rwth-aachen.de