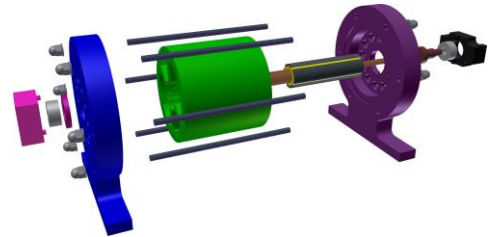


Simulator for Manufacturing Deviations

Technical data

- Surface mounted permanent magnet synchronous machine
 - 6 teeth and 4 poles
 - 2 mm air gap width
- Free adjustable static eccentricity (0 to 2 mm)
- Rotors for dynamic eccentricity (0.25 mm and 0.5 mm)
- Six exchangeable single tooth windings with the possibility of different numbers of turns
- Possibility of magnetization deviation of permanent magnets



Rated speed	3000 rpm
Rated torque	3 Nm
Rated current	5 A
Maximum Speed	5000 rpm
Maximum Torque	9 Nm

Equipment

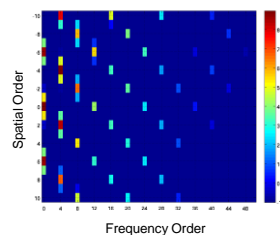
- dSPACE rapid control prototyping system DS1103 PPC controller board to control the permanent magnet synchronous machine
- 4-quadrant amplifier DM 15000/PAS (Spitzenberger & Spies) to supply the electrical machine with ideal sinusoidal currents
- Water-cooled magnetic particle brake 1PB43 (Magtrol) with a rated torque of 5 Nm, a rated power of 500 W and a maximum speed of 4000 rpm
- Torque measuring shaft T22 (HBM) with 10 Nm measurement range and accuracy class 0.5



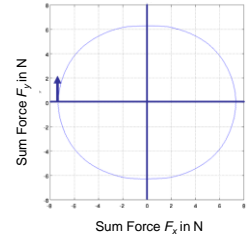
Application

- Study of manufacturing tolerance's influence on the acoustics of the electrical machine and retroactive effects on the machine control
- Simple stator geometry without tooth tip, to simplify the validation with analytical models
- Detection of manufacturing deviations through measurement of machine parameters
- Investigation of specific current injection in order to compensate the effects aroused by manufacturing deviations

Rad. Force Density f_{rad} in dB (1 N/m²)



Sum Forces (xy-direction)



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