



《Motor-CAD Lab计算》

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内容提要

- 1.配置并创建详细、准确的电磁损耗计算模型
- 2.电压和工作点定义, 匝数和温度范围设置
- 3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算
- 4.对转矩-转速曲线和考虑到温度极限的MAP图进行计算
- 5.计算来自于转矩、转速关于时间的定义
- 6.Lab和热计算耦合

1.配置并创建详细、准确的电磁损耗计算模型



Model Build | Calculation | Electromagnetic | Thermal | Duty Cycle | Operating Point | Generator | Calibration | Settings

Model Options | Loss Model

Saturation Model:

Model Type:

- Fixed Inductance Model
- Saturation Model (Single Step)
- Saturation Model (Full Cycle)

Model Resolution:

- Coarse (15 points)
- Fine (30 points)
- Custom

Custom Model Resolution:

No. Current Points:

No. Phase Advance Points:

Total No. Points:

Loss Model:

Model Type:

- Neglect
- FEA Map (recommended)
- Custom

Machine Parameters:

Pole Number:

Slot Number:

Winding Connection:

- Star Connection (default)
- Delta Connection

Fixed Inductance Model:

Magnet Flux Linkage (λ_m):

D-Axis Inductance (L_d):

Q-Axis Inductance (L_q):

Short-Circuit Current (Isc):

Saturation Model:

Curve Fit Goodness (%):

Model Status:

Model	Build Date	Method	Max Current
			A (peak)
Saturation			
Iron Loss			
AC Loss			
Magnet Loss			

Model Build:

Parameters:

Maximum speed:

Max stator current (Peak):

Max stator current (RMS):

Maximum rotor current:

Build:

- Saturation Model
- Loss Model

Build Model

Cancel Model Build

1.配置并创建详细、准确的电磁损耗计算模型



Model Build Calculation Electromagnetic Thermal Duty Cycle Operating Point Generator Calibration Settings

Model Options Loss Model

Saturation Model:

Model Type:

Fixed Inductance Model

Saturation Model (Single Step)

Saturation Model (Full Cycle)

Model Resolution:

Coarse (15 points)

Fine (30 points)

Custom

Custom Model Resolution:

No. Current Points:

No. Phase Advance Points:

Total No. Points:

Loss Model:

Model Type:

Neglect

FEA Map (recommended)

Custom

Machine Parameters:

Pole Number:

Slot Number:

Winding Connection:

Star Connection (default)

Delta Connection

Fixed Inductance Model:

Magnet Flux Linkage (λ_m):

D-Axis Inductance (L_d):

Q-Axis Inductance (L_q):

Short-Circuit Current (I_{sc}):

Saturation Model:

Curve Fit Goodness (%):

Model Status:

Model	Build Date	Method	Max Current
Saturation	13-08-21 14:29	30 points full cycle	480 <small>A (peak)</small>
Iron Loss	13-08-21 14:29	FEA Map 30 points	480
AC Loss			
Magnet Loss	13-08-21 14:29	FEA Map 30 points	480

Model Build:

Parameters:

Maximum speed:

Max stator current (Peak):

Max stator current (RMS):

Maximum rotor current:

Build:

Saturation Model

Loss Model

Build Model

Cancel Model Build

1.配置并创建详细、准确的电磁损耗计算模型



Model Build | Calculation | Electromagnetic | Thermal | Duty Cycle | Operating Point | Generator | Calibration | Settings

Model Options | Loss Model

Geometry | Winding | Input Data | Calculation

Materials | Settings | Material database

Geometry | E-Magnetics | Calculation | Graph

General | Bearings | AC Winding

AC Winding Losses:

AC Winding Losses:
AC Winding Loss Model:
 None (default)
 Hybrid FEA
 Full FEA

Bundle Dimensions:
 Include Bundle Effect
Bundle Aspect ratio:

Hybrid Model:
Adjustment Factor:

Stator Copper Loss:

Calculation Type:
 DC Only
 DC + AC (User)
 DC + AC (FEA single point)
 DC + AC (FEA Map)

DC Resistance / Phase:

AC Loss Model:
Reference Speed:
Rac / Rdc:
Frequency Scaling:

Iron Loss:

Calculation Type:
 Neglect
 OC + SC (User)
 OC + SC (FEA)
 FEA Map

OC + SC Model:
Hysteresis: Ah: Bh:
Eddy: Ae: Be:

Solid Rotor Loss:

Speed Scaling Coefficient:

FEA Loss Maps:

Reference Speed:

Magnet Loss:

Calculation Type:
 Neglect
 User Defined
 OC + SC (FEA)
 FEA Map

User-Defined Model:
On Load Loss:
No Load Loss:
Current:
Speed Scaling Coefficient:
Reference Speed:

Sleeve Loss:

Calculation Type:
 Neglect
 FEA Map

Speed Scaling Coefficient:

Banding Loss:

Calculation Type:
 Neglect
 FEA Map

Speed Scaling Coefficient:

Model Status:

Model	Build Date	Method	Max Current
			A (peak)
Saturation	13-08-21 14:42	30 points full cycle	480
Iron Loss	13-08-21 14:42	FEA Map 30 points	480
AC Loss	13-08-21 14:42	FEA Map 30 points	480
Magnet Loss	13-08-21 14:42	FEA Map 30 points	480

Model Build:

Parameters:
Maximum speed:
Max stator current (Peak):
Max stator current (RMS):
Maximum rotor current:

Build:
 Saturation Model
 Loss Model

2.电压和工作点定义, 匝数和温度范围设置



Model Build Calculation Electromagnetic Thermal Duty Cycle Operating Point Generator Calibration Settings

General Custom Losses

Drive:

DC Bus Voltage:

Maximum Modulation Index:

Operating Mode:

Motor

Generator

Motor / Generator

Control Strategy:

Maximum Torque/Amp

Maximum Efficiency

Constant Phase Advance = 0

User Defined

Speed	Phase Advance
0	0
1000	15
2000	30

DC Current Limit:

None

Current Limit

Maximum DC Current:

Losses:

Iron Loss Build Factors:

Stator: Rotor:

Hysteresis: Eddy:

Magnet Loss Build Factor:

Mechanical Loss:

Calculation Type:

Neglect

User Defined

Friction Loss:

Friction Loss Exponent:

Windage Loss:

Windage Loss Exponent:

Reference Speed:

Scaling:

Turns / Coil:

Model build reference:

Resistance reference:

Calculation:

Stator Winding Temperature:

Reference temperature:

Calculation temperature:

Temp. Coeff. Resistivity:

AC Loss Temperature Scaling:

Reference temperature:

Temperature Exponent:

Magnet Temperature:

Reference temperature:

Calculation temperature:

Magnet Flux Coefficient:

3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算



Model Build | Calculation | **Electromagnetic** | Thermal | Duty Cycle | Operating Point | Generator | Calibration | Settings

Calculation:

Calculation Type:

- Maximum Torque/Speed Curve
- Efficiency Map**
- Torque Grid

Options:

- Smooth Map
- Power Limit

Max Power:

Speed:

Maximum:

Step:

Minimum:

Current:

Maximum (Peak):

Maximum (RMS):

No. of Increments:

Minimum (Peak):

Minimum (RMS):

Torque:

Maximum:

No. of Increments:

Minimum:

Calculation Status:

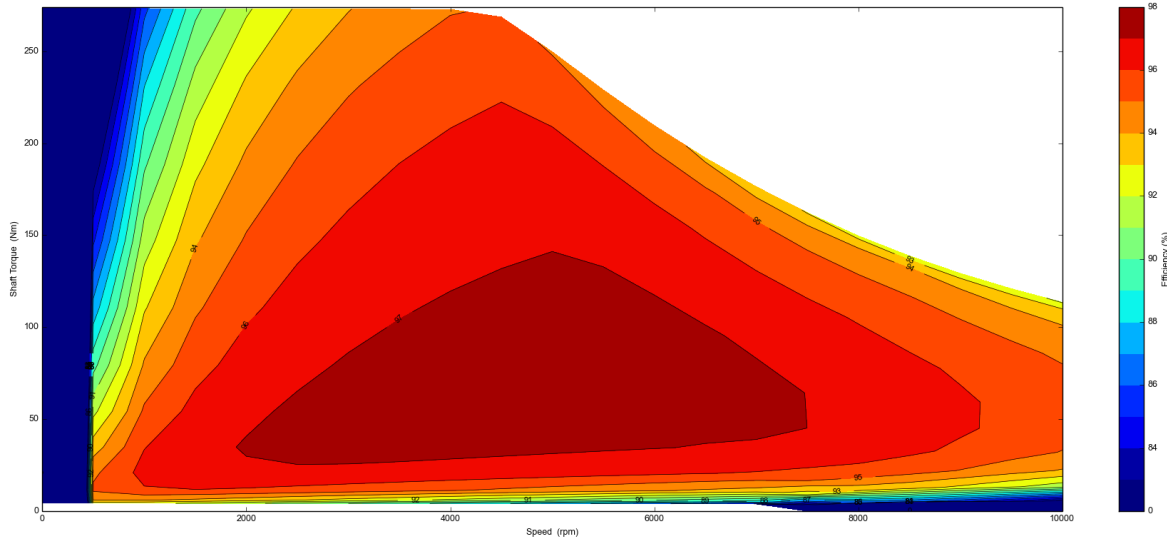
13-08-21 14:44:07: Electromagnetic calculation completed with Ismax =480.0A current steps = 12
Maximum speed = 10000.0rpm

Calculate Emagnetic Performance

Cancel Calculation

Load Results Viewer

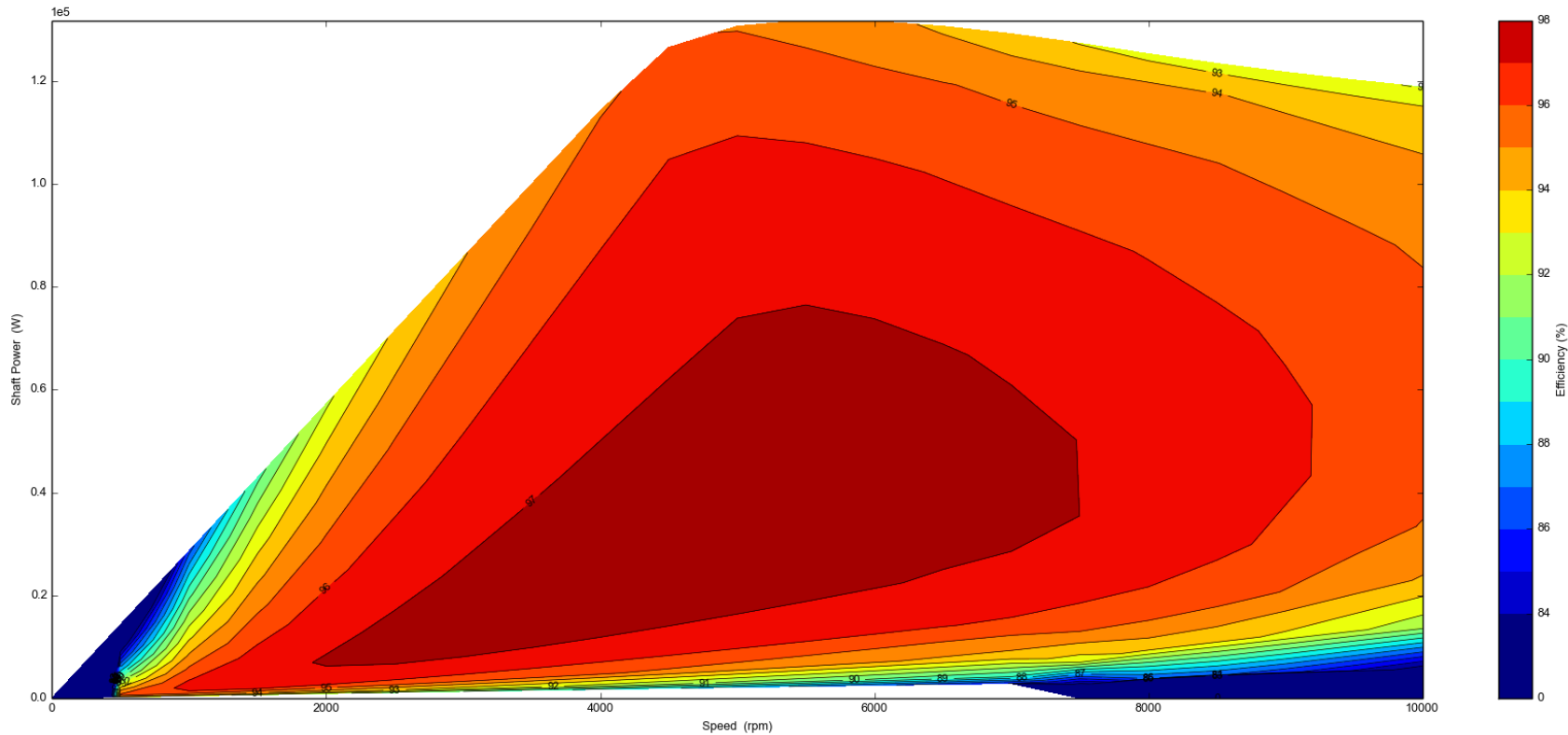
3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算



Efficiency Map Data:

	Value
Efficiency Above 98.0%	0.00
Efficiency Above 97.0%	18.11
Efficiency Above 96.0%	45.61
Efficiency Above 95.0%	66.17
Efficiency Above 94.0%	76.30
Efficiency Above 93.0%	81.44
Efficiency Above 92.0%	84.36
Efficiency Above 91.0%	87.55
Efficiency Above 90.0%	87.76
Efficiency Above 89.0%	90.04
Efficiency Above 88.0%	90.17
Efficiency Above 87.0%	91.95
Efficiency Above 86.0%	92.27
Efficiency Above 85.0%	92.92
Efficiency Above 84.0%	93.83
Efficiency Above 83.0%	93.99

3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算



3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算



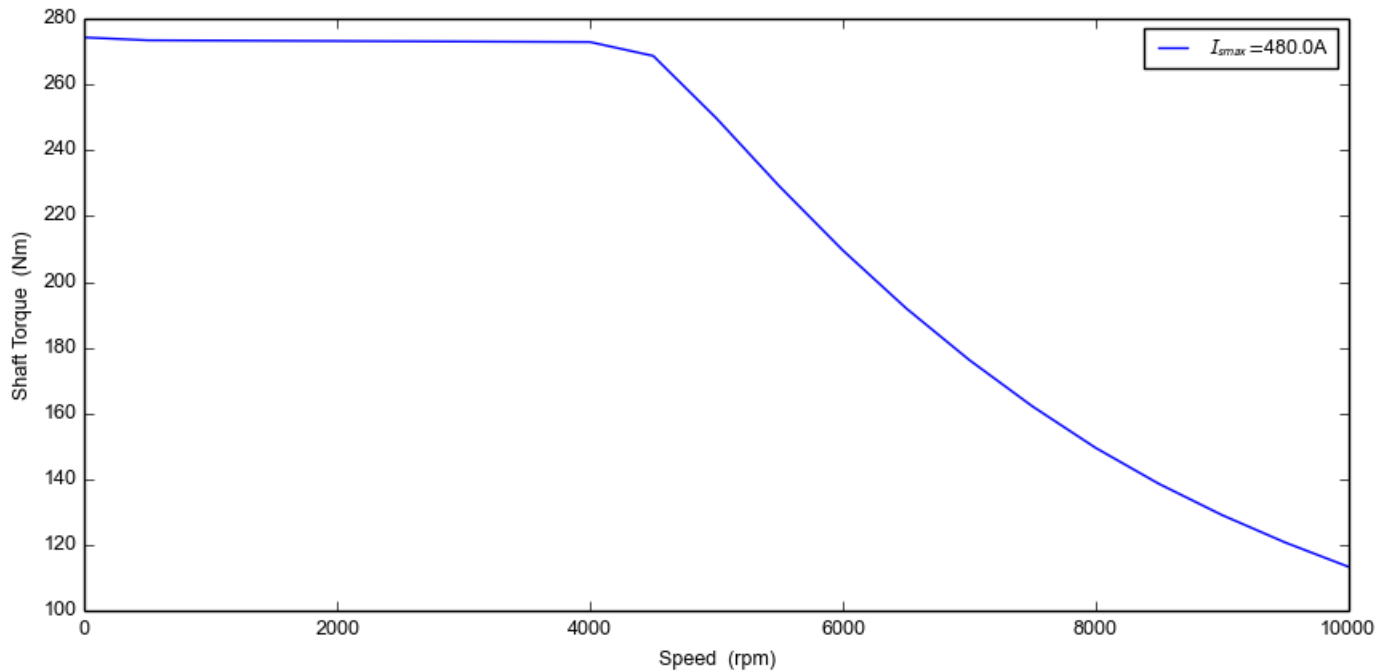
Contour Mode Surface Mode Grid On Show Drive Cycle Show Legend Export Figure Export Data Refresh Drive Cycle Refresh Units Comparison Mode

Graphing Data Graph Settings Export Settings Analysis

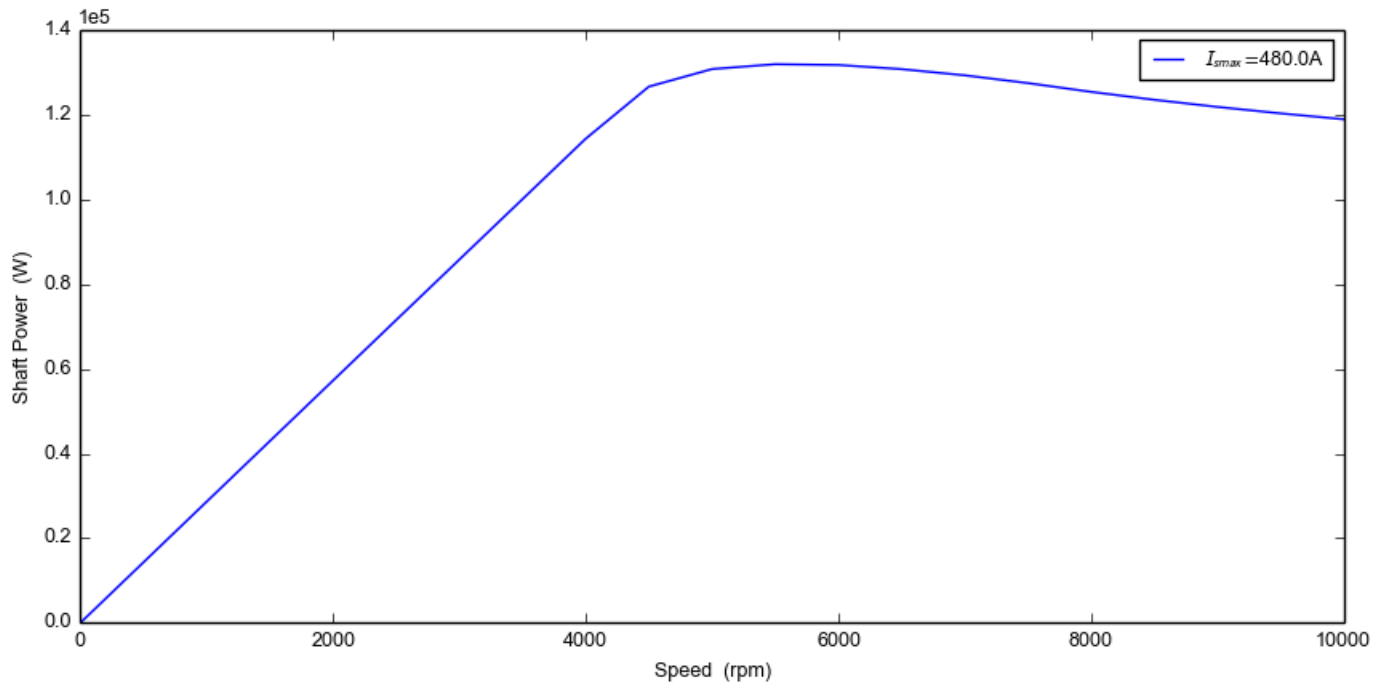
Speed

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
2	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
3	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
4	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
5	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
6	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
7	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
8	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
9	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
10	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
11	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....
12	0.00	500.00	1000....	1500....	2000....	2500....	3000....	3500....	4000....	4500....	5000....	5500....	6000....	6500....	7000....	7500....	8000....	8500....	9000....	9500....	1000....

3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算



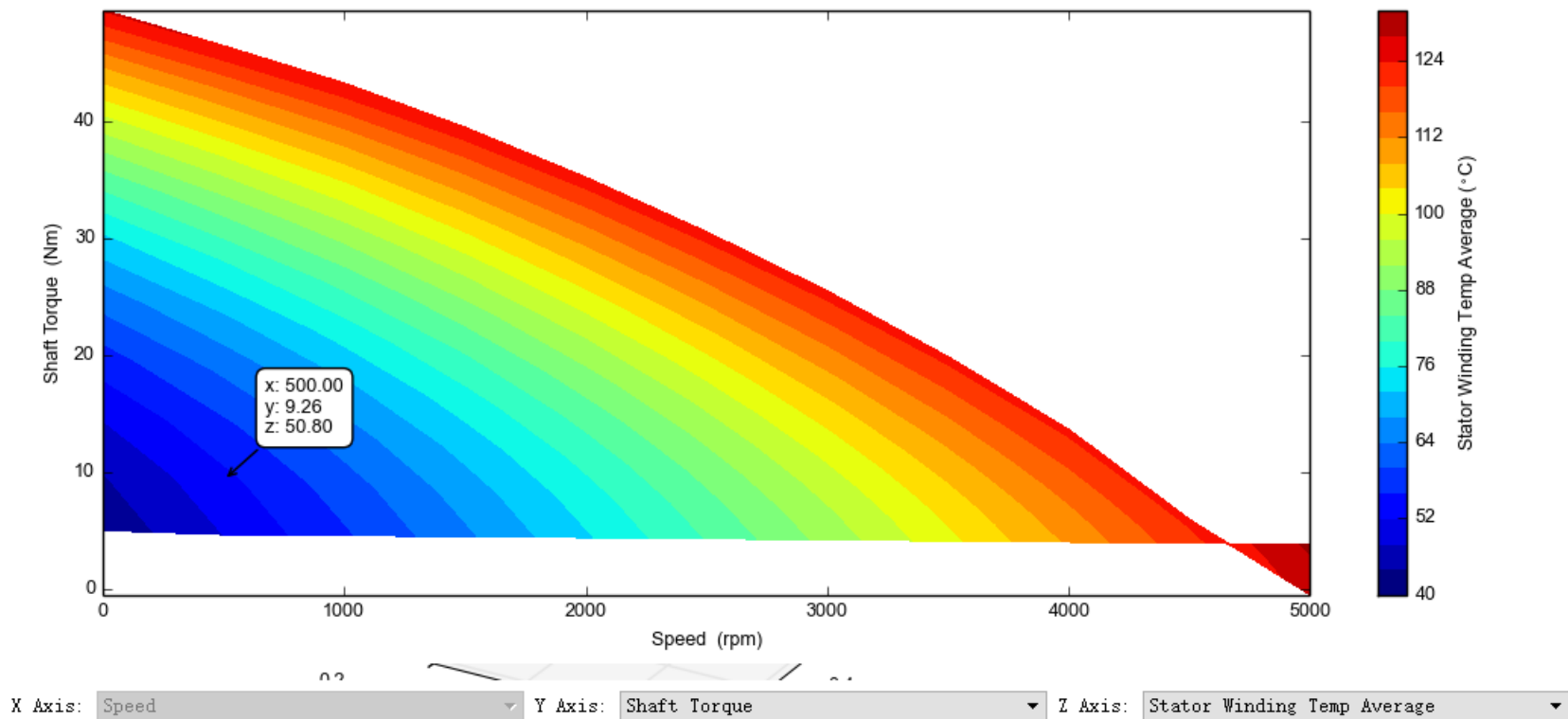
3.对转矩-转速和效率MAP图、损耗、工况数据等进行电磁计算



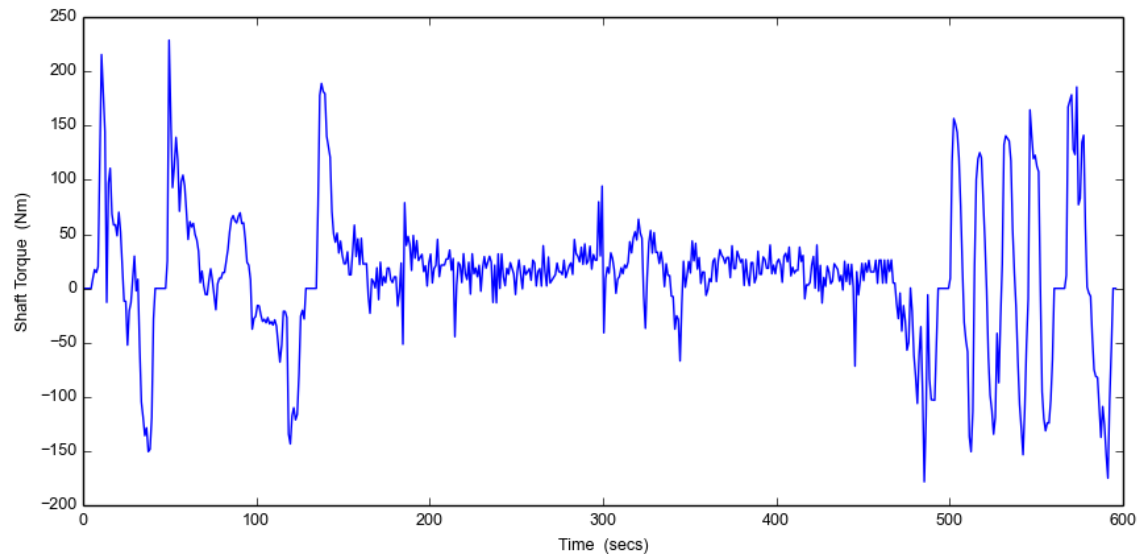
4.对转矩-转速曲线和考虑到温度极限的MAP图进行计算



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5.计算来自于转矩、转速关于时间的定义



Graphing Data Graph Settings Export Settings Analysis

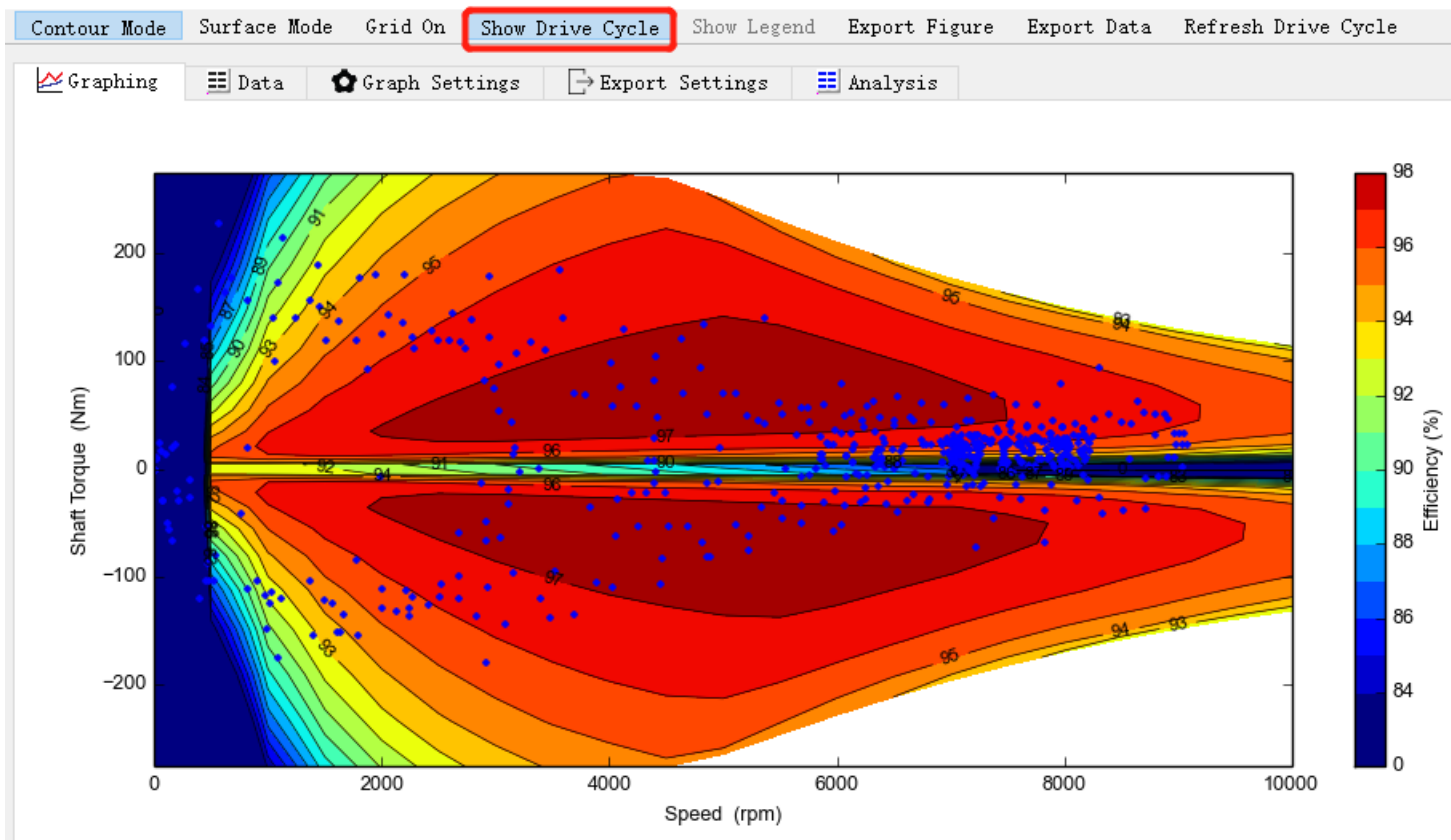
Duty Cycle Data

	Value
Average Efficiency (Energy Use) (%)	95.81
Average Efficiency (Point by Point) (%)	92.89
Electrical Input Energy (Wh)	2303.39
Shaft Motoring Energy (Wh)	2207.11
Electrical Output (Recovered) Energy (Wh)	719.13
Shaft Generating Energy (Wh)	750.77
Total Loss (Wh)	127.93
Copper Loss (Wh)	61.70
Iron Loss (Wh)	66.20
Magnet Loss (Wh)	0.03
Mechanical Loss (Wh)	0.00

5. 计算来自于转矩、转速关于时间的定义



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5.计算来自于转矩、转速关于时间的定义



Model Build | Calculation | Electromagnetic | Thermal | Duty Cycle | Operating Point | Generator | Calibration | Settings

Calculation:

Input:

Definition:

- Torque
- Maximum Current
- Maximum Temperature
- Current/Phase Advance

Speed: 6000

Torque: 100

Phase Advance: 0

Maximum Currents:

Stator Current (Peak): 150

Stator Current (RMS): 106.1

Rotor Current: 6

Maximum Temperatures:

Stator Winding: 160

Magnet: 140

Change Thermal Settings

Linkage Options:

Lab ↔ Thermal Coupling:

- No coupling (default)
- Losses → Thermal
- Iterate to Converged Solution

Lab ↔ E-Magnetic Coupling:

- No coupling (default)
- Operating Point → E-Magnetic

Calculate Operating Point

Cancel Calculation

Variable	Value	Units	Variable	Value	Units
Shaft Speed	6000	rpm	Total Loss	1779	Watts
Shaft Torque	100	Nm	Stator Copper Loss	1202	Watts
Shaft Power	6.283E004	Watts	DC Stator Copper Loss	744.6	Watts
Efficiency	97.25		AC Stator Copper Loss	457.5	Watts
----			----		
Stator Phase Current (peak)	192.6	Amps	Iron Loss	577	Watts
Stator Line Current (peak)	192.6	Amps	Magnet Loss	0.315	Watts
DC Terminal Current	161.5	Amps	Mechanical Loss	0	Watts
Phase Voltage (peak)	230.9	Volts	----		
Line Voltage (peak)	400	Volts	Electromagnetic Power	6.345E004	Watts
Phase Advance	44.87	EDeg	Electromagnetic Torque	101	Nm
----			Magnet Torque	62.04	Nm
Flux Linkage D	45.71	mVs	Reluctance Torque	38.95	Nm
Flux Linkage Q	77.92	mVs	Terminal Power	6.461E004	Watts
Magnet Flux Linkage	75.74	mVs	Power Factor	0.9682	
D axis Inductance	0.2209	mH			
Q axis Inductance	0.5708	mH			

5. 计算来自于转矩、转速关于时间的定义



Geometry Winding Input Data Calculation E-Magnetics Output Data Graphs Sensitivity Scripting

Drive:
Shaft Speed: 5000
Line Current Definition:
 Peak
 RMS
 RMS Current Density
Peak Current: 192.6
RMS Current: 136.2
RMS Current Density: 7.526
DC Bus Voltage: 400
Phase Advance [elec deg]: 44.87

Temperatures:
Armature Winding Temperature: 65
Magnet Temperature: 65
Stator Lamination Temperature: 20
Rotor Lamination Temperature: 20
Stator Sleeve Temperature: 20
Rotor Banding Temperature: 20
Shaft Temperature: 20
Armature Wedge Temperature: 20
Housing Temperature: 20

Performance Tests:
Single operating points:
 Open Circuit
 Q axis current only
 On Load

Open Circuit:
 Back EMF
 Cogging Torque
 Electromagnetic Forces

On Load:
 Torque
 Torque Speed Curve
 Demagnetization
 Electromagnetic Forces

Parameters:
 Self and Mutual Inductances

Transient:
 Sudden short-circuit

E-Magnetic ↔ Thermal Coupling:
E-Magnetic ↔ Thermal Coupling:
 No coupling (default)
 E-Magnetic Losses → Thermal
 E-Magnetic ← Thermal Temperatures
 Iterate to Converged Solution

Skew:
Skew Type:
 None (default) Stator Skew: 0
 Stator Rotor slices: 1
 Rotor

Drive:
Drive Type:
 Defined Currents (Default)
 Calculated Currents
Drive Mode:
 Sine
 Square
 Custom
 Passive Generator

Winding Connection:
 Star Connection (default)
 Delta Connection

Magnetisation:
 Parallel
 Radial
 Halbach Continuous Ring Array
 Halbach Sinusoidal Array

Variable	Value	Units
Maximum torque possible (DQ) (For Phase Advance of 29.39 EDeg)	110.65	Nm
Average torque (virtual work)	102.41	Nm
Average torque (loop torque)	101.75	Nm
Torque Ripple (MsVw)	18.756	Nm
Torque Ripple (MsVw) [%]	18.41	%
Speed limit for constant torque (For Phase Advance of 44.87 EDeg)	5940.1	rpm
No load speed	7347.1	rpm
Speed limit for zero q axis current	INF	rpm
---	---	---
Electromagnetic Power Operating point near voltage limit.	64011	Watts
Input Power	65213	Watts
Total Losses (on load)	1778.6	Watts
Output Power Operating point near voltage limit.	63434	Watts
System Efficiency	97.273	%
---	---	---
Shaft Torque	100.96	Nm
---	---	---
Power Factor [Waveform] (lagging)	0.96675	
Power Factor Angle [Waveform]	14.817	EDeg
Power Factor [THD]	0.91473	
Power Factor [Phasor] (lagging)	0.96593	
Power Factor Angle [Phasor]	15	EDeg
Load Angle [Phasor]	59.687	EDeg
Phase Terminal Voltage (ms) [Phasor]	164.93	Volts

Solve E-Magnetic Model

Cancel Solving

6.Lab和热计算耦合



Model Build | Calculation | Electromagnetic | Thermal | **Duty Cycle** | Operating Point | Generator | Calibration | Settings

Calculation | **Duty Cycle Definition**

Duty Cycle:

Duty Cycle Type:
 Custom Duty Cycle
 Automotive Drive Cycle

Automotive Drive Cycle:
US06

Thermal Transient Coupling:
 No coupling (default)
 Losses → Thermal
 Coupled Transient Solution

Duty Cycle Data:
Number of Cycles: 1
Transient Duration: 596
Number of Points: 596
RMS Torque: 60.62
RMS Torque [μ]: 4.041
Average Speed: 5464

Calculation Status:
13-08-21 18:02:47: duty cycle calculation completed

Calculate Duty Cycle Performance

Cancel Calculation

Transfer Duty Cycle Losses To Thermal Model

Load Results Viewer

Vehicle Model:

Mass:	1521	Frontal Area (m²):	2.29	Wheel Radius (m):	0.3
Rolling Resistance Coefficient:	0.007	Drag Coefficient:	0.28	Mass Correction Factor:	1.04
Air Density:	1.225	Gear Ratio:	7.938	Motoring Torque Ratio:	1
Generating Torque Ratio:	1	Max. Torque: <input type="checkbox"/>	500	Max. Speed: <input type="checkbox"/>	2E4

5. 计算来自于转矩、转速关于时间的定义



Geometry Winding Input Data Calculation Temperatures Output Data Transient Graph

Calculation Transient Duty Cycle

Calculation: Shaft Speed: 6000

Calculation Type:

- Steady State
- Transient

Details:

Loss Source:
Losses from
[Duty Cycle table](#)

Model Options:

Model Size:

- Full model (default)
- Reduced node model

Model Type:

- 3D model (default)
- 2D model for FEA calibration

Steady State Coupling:

E-Magnetic ↔ Thermal Coupling:

- No coupling (default)
- E-Magnetic Losses → Thermal
- E-Magnetic ← Thermal Temperatures
- Iterate to Converged Solution

Lab ↔ Thermal Coupling:

- No coupling (default)
- Lab Losses → Thermal
- Iterate to Converged Solution

Solve Thermal Model

Geometry Winding Input Data Calculation Temperatures Output Data Transient Graph Sensi

Calculation Transient Duty Cycle

Transient Calculation Data:

Transient Calculation Type:

- Simple Transient
- Duty-Cycle Analysis

Point Storage Reduction: 1

Simple Transient:

Transient Duration: 140
Number of Points: 50
Time between Points: 2.8
Change in Tambient: 0

Duty Cycle:

Number of Cycles: 1
Transient Duration: 596
Number of Points: 596
RMS Torque: 1
RMS Torque [pu]: 0.06667
Average Speed: 5464

Transient Definition:

- User Defined Losses
- Torque

Torque: 10

Transient End Point:

End Point Definition:

- Fixed Duration (default)
- Stable Temperatures
- Temperature Limit

Temperature Limit:

- Amature Winding Temperature: 180
- Bearing Temperature: 180
- Encoder Temperature: 180
- Magnet Temperature: 180

Transient Start Point:

Initial Transient Temperatures:

- Ambient Temperature (default)
- Steady State Temperatures
- Previous Transient Temperatures (if same network)
- Whole machine at specified temperature
- Machine components at specified temperatures

Transient Data Notes:

US06 Drive Cycle

6.Lab和热计算耦合



Geometry
 Winding
 Input Data
 Calculation
 Temperatures
 Output Data
 Transient Graph
 Sensitivity
 Scripting

Calculation
 Transient
 Duty Cycle

Duty Cycle Data:

Legend for Losses [Watts]:

- Armature Copper Loss (Yellow circle)
- Armature Copper Loss AC (Yellow triangle)
- Stator Back Iron Loss (Black asterisk)
- Stator Tooth Loss (Red diamond)
- Magnet Loss (Green diamond)
- Rotor Back Iron Loss (Blue inverted triangle)
- Magnet Pole Loss (Blue X)
- Front Bearing Loss (Black asterisk)
- Rear Bearing Loss (Black diamond)
- Windage Loss (Black diamond)
- Windage Ext Fan Loss (Black line)

Period	Elapsed Time	Time	Points	Armature Copper DC	Armature Copper AC	Stator Back Iron	Stator Tooth	Magnet	Rotor Back Iron	Embedded Magnet Pole	Friction Front Bearing	Friction Rear Bearing	Windage	Windage Exterior Fan	Shaft Speed [Start]
Units	secs	secs		Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	rpm
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0
4	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0
5	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0
6	6	1	1	8.662	0.0001829	0.1558	0.1746	0	0.0006832	0.0179	0	0	0	0	0
7	7	1	1	28.37	0.004677	0.7404	0.902	1.45E-05	0.003058	0.08903	0	0	0	0	22.59
8	8	1	1	20.65	0.01729	1.464	1.748	5.301E-05	0.005983	0.1741	0	0	0	0	79.07

Duty Cycle Control:

Duty Cycle Definition:
 Torque - Speed
 Loss - Speed
 Current - Speed
 Vehicle Speed

Duty Cycle Input Type:
 pu Value
 Shaft Torque:

Drive During Period: **DC Bus Voltage:**
 Fixed Variable
 Fixed Variable

External Duty Cycle Data:
 File:

 Save Duty Cycle Data in .mot file

6.Lab和热计算耦合



Geometry
 Winding
 Input Data
 Calculation
 Temperatures
 Output Data
 Transient Graph
 Sensitivity
 Scripting

Calculation
 Transient
 Duty Cycle

Duty Cycle Data:

Period	Elapsed Time	Time	Points	Armature Copper DC	Armature Copper AC	Stator Back Iron	Stator Tooth	Magnet	Rotor Back Iron	Embedded Magnet Pole	Friction Front Bearing	Friction Rear Bearing	Windage	Windage Exterior Fan	Shaft Speed [Start]
Units	secs	secs		Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	rpm
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0
4	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0
5	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0
6	6	1	1	8.662	0.0001829	0.1558	0.1746	0	0.0006832	0.0179	0	0	0	0	0
7	7	1	1	28.37	0.004677	0.7404	0.902	1.45E-05	0.003058	0.08903	0	0	0	0	22.59
8	8	1	1	20.65	0.01729	1.464	1.748	5.301E-05	0.005983	0.1741	0	0	0	0	79.07

Duty Cycle Control:

Add Period **Remove Period**

Duty Cycle Definition:
 Torque - Speed
 Loss - Speed
 Current - Speed
 Vehicle Speed

Duty Cycle Input Type:
 pu Value Shaft Torque: 15

Drive During Period: **DC Bus Voltage:**
 Fixed Variable Fixed Variable

External Duty Cycle Data:
 File: No File Selected

 Save Duty Cycle Data in .mot file

6.Lab和热计算耦合

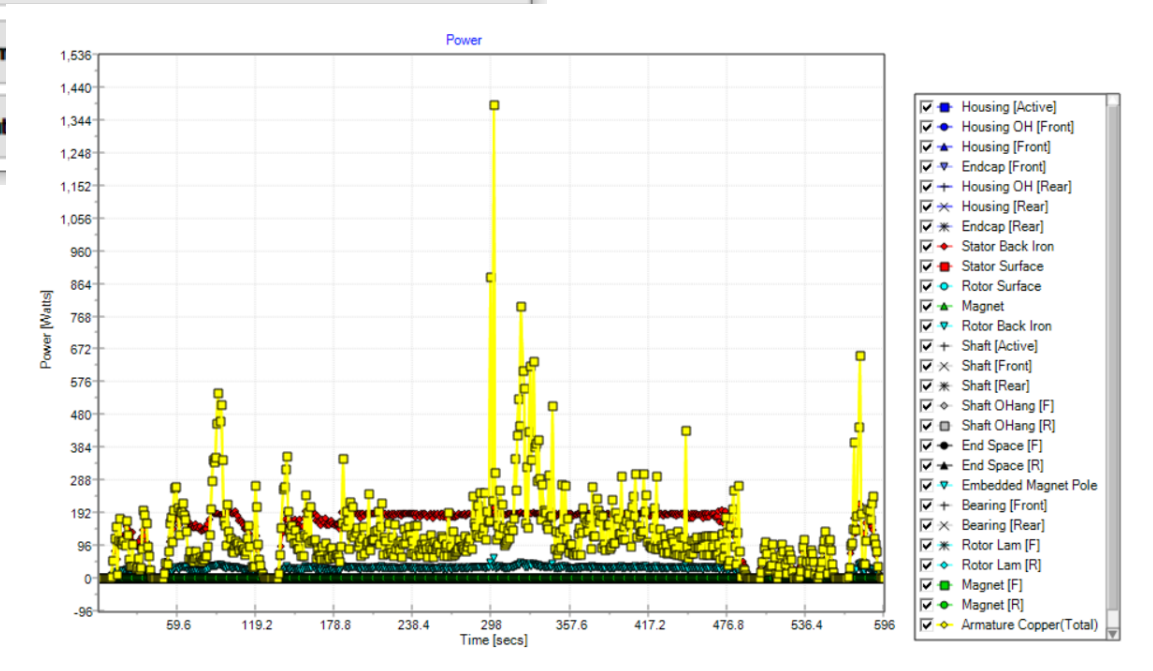


Transient Progress

Cancel Calculation

Enable Autom...

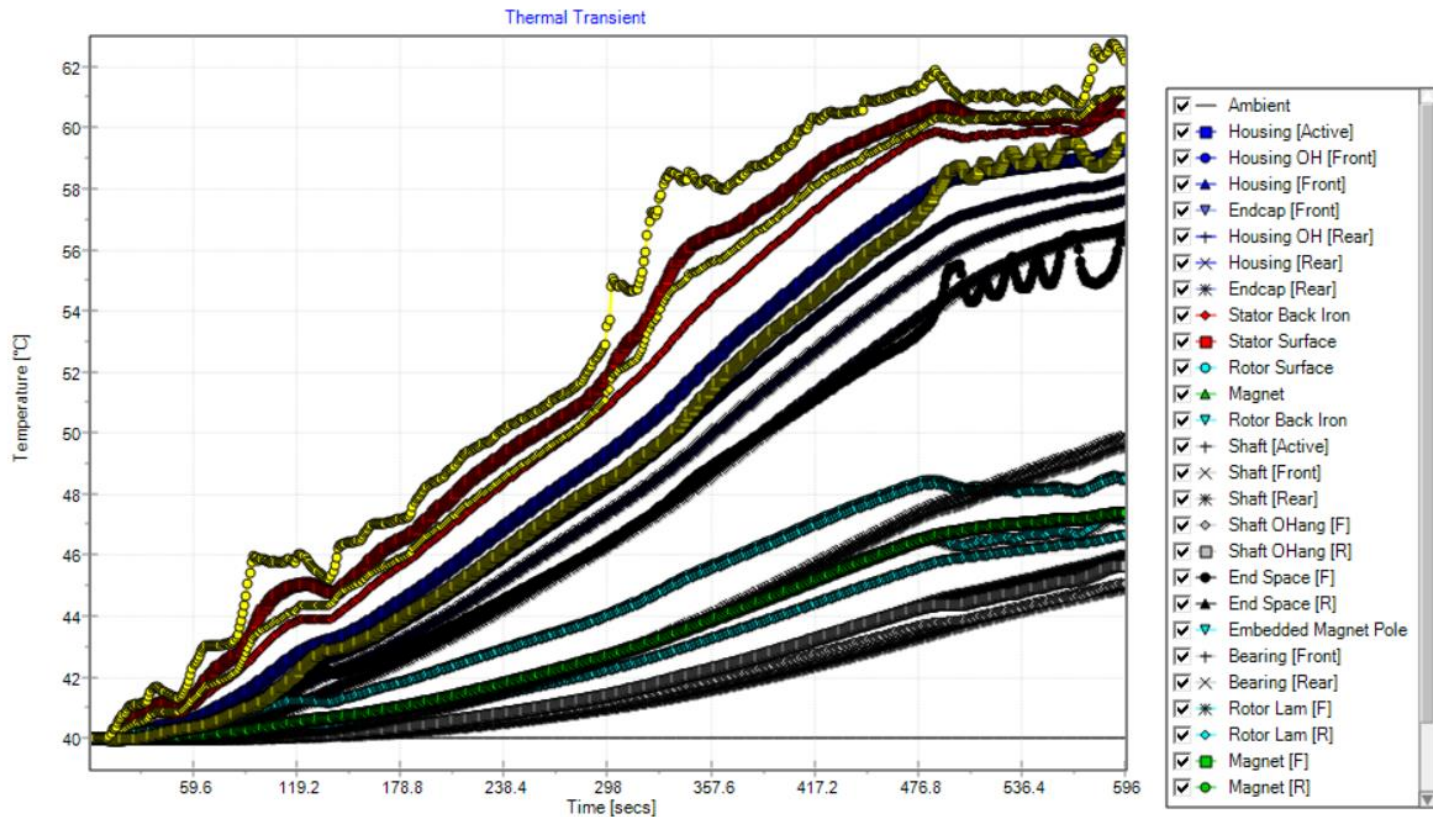
Show Updat...



6.Lab和热计算耦合



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大咖慧，顾名思义，汇集众多大咖智慧。

是由安世亚太打造的一个以设计、仿真、增材制造等领域技术和行业专家为主的智慧学习平台。目前主要通过线上培训、研讨等方式，由行业相关领域资深专家与学员们分享交流最新技术和应用研究成果。

如有任何需求、建议，请关注订阅号（peraglobal），给我们留言

