华北电力大学
North China Electric Power University

Examples of Doctoral Dissertation Writing

illustration：

The examples cited in the specifications are only examples of the writing format of the paper, and do not represent the demonstration of the research content of the paper.

华北电力大学

学术博士学位论文 (SimSun, 24pt, bold)

局部多孔质气体静压轴承关键技术的研究

(SimHei（黑体）, 22pt)

Research on Key Technologies of Partial Porous Externally Pressurized Gas Bearing

(Times New Roman 22pt, bold，If the title is too long, use 18pt bold)

于梅 (SimSun, 18pt, bold)

2024 年 6 月 (SimSun, 18pt, bold)

国内图书分类号：××××　　学校代码：10054
国际图书分类号：××××　　密　　级：公开

↑　　↑

(SimSun, 12pt)　　(SimSun, 12pt)

。。

学术博士学位论文

↑

(SimSun (宋体), 18pt, bold)

局部多孔质气体静压轴承关键技术的研究

↑

(SumHei, 22pt)

The left side of the colon is in SumHei (黑体) 14pt, the right side of the colon is in SimSun (宋体) 14pt, with multiple spacing 1.5 between the lines

博士研究生：于梅

导　　师：□□□教授

申请学位：**博士

学　　科：

专　　业：

所在学院：电气与电子工程学院

答辩日期：2024 年 6 月

授予学位单位：华北电力大学

Classified Index: ××××　（Times New Roman 12pt）

U.D.C: ××××　（Times New Roman 12pt）

Dissertation for the Academic Doctoral Degree

↑

（Times New Roman 18pt)

Research on Key Technologies of Partial Porous Externally Pressurized Gas Bearing

↑

（Times New Roman 18pt, bold; If the title is too long, use a small 2pt)

Candidate： Yu Mei

Supervisor： Prof.□□□

Co- Supervisor： Prof.□□□

Academic Degree Applied for： Doctor of □□□□

Subject:

Speciality：

School： School of

Date of Defence： June, 2024

Degree-Conferring-Institution： North China Electric Power University

↑

（Times New Roman 14pt)

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作者签名：　　日期：　　年　　月　　日

This page need to be filed by hand.

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学位论文系研究生在华北电力大学攻读学位期间在导师指导下完成的成果，知识产权归属华北电力大学所有，学位论文的研究内容不得以其它单位的名义发表。研究生完全了解华北电力大学关于保存、使用学位论文的规定，同意学校保留并向有关部门送交论文的复印件和电子版本，同意学校将学位论文的全部或部分内容编入有关数据库进行检索，允许论文被查阅和借阅，学校可以为存在馆际合作关系的兄弟高校用户提供文献传递服务和交换服务。本人授权华北电力大学，可以采用影印、缩印或其他复制手段保存论文，可以公布论文的全部或部分内容。

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导师签名：　　日期：　　年　　月　　日

摘　　要　　（SumHei 18pt）

摘要是论文内容的高度概括，应具有独立性和自含性，即不阅读论文的全文，就能获得必要的信息。摘要应包括本论文的目的、主要研究内容、研究方法、创造性成果及其理论与实际意义。摘要中不宜使用公式、化学结构式、图表和非公知公用的符号和术语，不标注引用文献编号。避免将摘要写成目录式的内容介绍。

关键词：关键词 1；关键词 2；关键词 3；……；关键词 5

（Content and keywords in 12pt, SimSun）

Except for the cover and inner cover, each page of the thesis should have a header, with a bold and thin double line (with a bold line on top and a width of 0.8mm) separated by a line on the core. The header should be printed in the center on the double line. The font size is 9pt, SimSun. The odd numbered pages header of the doctoral thesis is the title number and title of this chapter, while the even numbered pages header is "Doctoral Dissertation of North China Electric Power University".

Abstract （Times New Roman 18pt, bold）

Externally pressurized gas bearing has been widely used in the field of aviation, semiconductor, weave, and measurement apparatus because of its advantage of high accuracy, little friction, low heat distortion, long life-span, and no pollution. In this thesis, based on the domestic and overseas researching……

Keywords: keyword 1，keyword 2，keyword 3， ……，keyword 5

(The content of the English abstract and the Chinese abstract should be consistent and accurate in grammar and vocabulary. Use commas to connect keywords. Content and keywords in 12pt, Times New Roman)

目　录　　（SumHei 18pt）

(Chapter headings in bold, section, article and paragraph headings in SimSun, all in 12pt)

Contents （Times New Roman 18pt, bold）

（Times New Roman 12pt, chapter names must be in bold）

Chapter 1 Introduction (Times New Roman, 18pt, Bold, placed in the middle; Paragraph Line Spacing: 1.35 line)

1.1 Research Background (Times New Roman, 16pt, Bold; Paragraph Line Spacing: 1.35 line, 0.5 line spacing before and

The development of advanced technologies such as national defense industry and microelectronics industry requires precision and ultra-precision instruments and equipment, and high-speed precision instruments and equipment. …… **(Times New Roman, 12pt; Paragraph Line Spacing: 1.25 line, Indent the first line by 2 characters)**

……

1.2 Development of Gas Lubricated Bearings

Gas bearing is a mechanical component which supports load or reduces friction by gas film. ……

……

1.2.1 Development of Gas Lubricated Bearings (Times New Roman, 14pt, Bold, 0.5 line spacing before and after)

In 1828, R.R.Willis[3] published an article on pressure distribution in orifice throttle plates, which is the earliest recorded literature on gas lubrication. ……

.....

1.2.5 Study on Porous Gas Hydrostatic Bearing

Because of the low pressure and compressibility of gases …… .

1.2.5.1 Classification of Hydrostatic Bearing (Times New Roman, 12pt, Bold; 0.5 line spacing before and after)

The Porous Hydrostatic Bearings can be classified as… … ..

1.2.5.2 Study on the Properties of Porous Materials

The main characteristic of the material is that it has a certain degree of....

[1] Porous materials with porous properties are made up of....

.....

Chapter 4 Research on Bearing Static Characteristics Based on FLUENT Software

4.1 Introduction

Using existing commercial software to study flow field can avoid solving N-S equation program. ……

4.2.3 The Setting of Boundary Conditions

In this paper, we adopt… In each direction… From the following two formulas:

$$\phi = \frac{D_p^2}{150}\frac{\psi^3}{(1-\psi)^2} \tag{4-1}$$

$$C_2 = \frac{3.5}{D_p}\frac{(1-\psi)}{\psi^3} \tag{4-2}$$

In formula D_p——Average particle diameter of porous materials (m);

ψ ——Porosity (Pore volume as a percentage of total volume);

ϕ ——Characteristic permeability or intrinsic permeability, related to the structural properties of materials (m^2).

……

4.3.3 Analysis of FLUENT simulation results

Figure 4-6 shows the pressure distribution in the local porous cylinder plunger and in the gas film when the radius of the local porous cylinder is different. The radii are rr=1.5mm, 2.5mm, 3.5mm and 4.5mm, respectively. From Fig.4-6, it can be seen that the throttling effect is very different because of the different throttling radius. Among them, the throttling effect with small radius is obvious. The pressure change corresponding to Fig.4-6 a) is the most obvious, while the change of Fig.4-6 d) is very small, which results in a great difference in the pressure distribution in the gas film. Thus, the bearing capacity is greatly improved with the increase of radius.

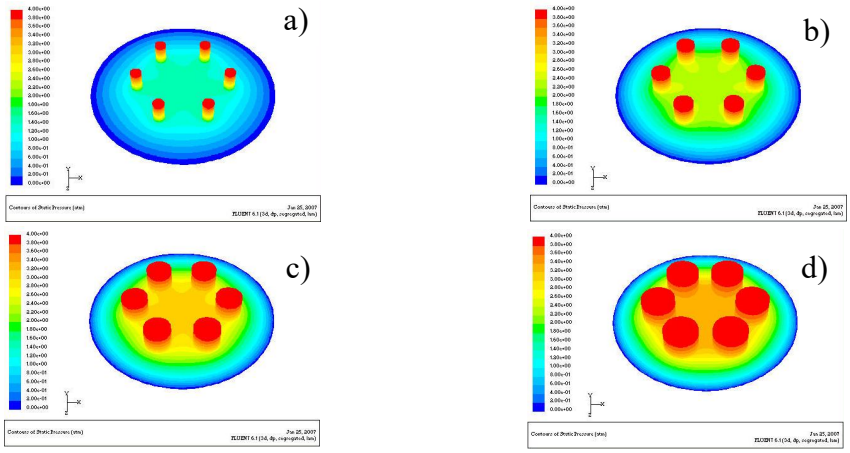
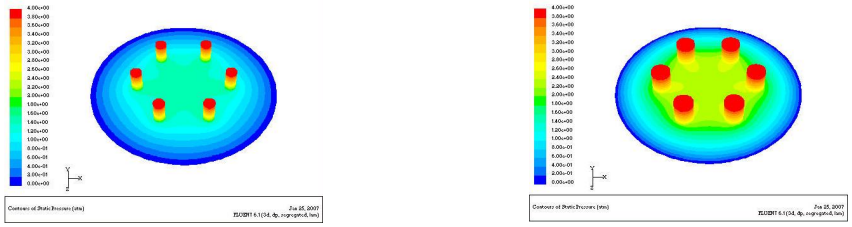


Fig.4-6 Pressure contour of bearing with partial porous plunger different radiuses

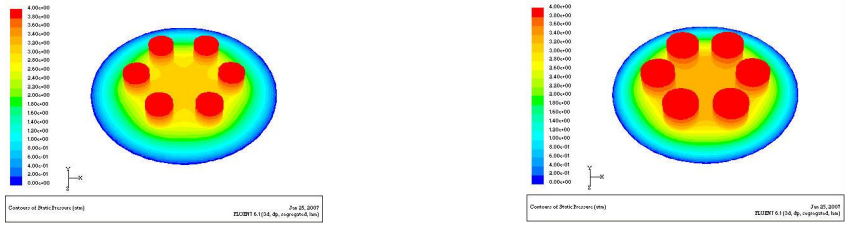
a) Pressure contour of bearing when R=1.5mm, b) Pressure contour of bearing when R=2.5mm
c) Pressure contour of bearing when R=3.5mm, d) Pressure contour of bearing when R=4.5mm

（It can also be written as shown in the example below）



a) Pressure contour of bearing when R_3=1.5mm

b) Pressure contour of bearing when R_3=2.5mm



c) Pressure contour of bearing when R_3=3.5mm

d) Pressure contour of bearing when R_3=4.5mm

Fig.4-6 Pressure contour of bearing with partial porous plunger different radiuses

4.4 Conclusion

……

Chapter 6 Experimental study on partial porous hydrostatic bearings

6.1 Introduction

In the preceding chapters, the permeability of locally porous materials is studied, respectively……

6.2 Porous graphite permeability test

……

The experimental data of sample No.1 is shown in the table. 6-1.

Table 6-1 Data of measured permeability of sample 1

(Temperature: T=16℃ Height: H=5.31mm)

Gas supply pressure P_s (MPa)	Flow measurement M'(m^3/h)	Flow correction value M (m^3/s) $\times 10^{-4}$	Pressure difference ΔP (Pa)	Lg ΔP	lg$M$
0.15	0.009	0.02312	46900	4.67117	-5.63601
0.2	0.021	0.04584	96900	4.98632	-5.33876
0.25	0.039	0.07413	146900	5.16702	-5.13001
0.3	0.097	0.16747	196900	5.29424	-4.77606
0.35	0.136	0.21753	246900	5.39252	-4.66248
0.4	0.171	0.25485	296900	5.47261	-4.59372
0.45	0.202	0.28467	346900	5.54020	--

Times New Roman, 10.5pt; the table need to be the standard three-lines table, title need to set on the top of table. Before the title, tag need to be set, example: "Table 6-1"

……

. . . . . If the form is more than one page long, it can be moved to the next page in the form of a continuation sheet:

Table 6-1　Data of measured permeability of sample 1

Gas supply pressure P_s (MPa)	Flow measurement M'(m³/h)	Flow correction value M (m³/s) × 10^{-4}	Pressure difference ΔP (Pa)	lgΔP	lg$M$
0.15	0.009	0.023 12	46 900	4.671 17	-5.636 01
0.2	0.021	0.045 84	96 900	4.986 32	-5.338 76
0.25	0.039	0.074 13	146 900	5.167 02	-5.130 01
0.15	0.009	0.023 12	46 900	4.671 17	-5.636 01
0.2	0.021	0.045 84	96 900	4.986 32	-5.338 76
0.25	0.039	0.074 13	146 900	5.167 02	-5.130 01
0.15	0.009	0.023 12	46 900	4.671 17	-5.636 01
0.2	0.021	0.045 84	96 900	4.986 32	-5.338 76
0.25	0.039	0.074 13	146 900	5.167 02	-5.130 01
0.15	0.009	0.023 12	46 900	4.671 17	-5.636 01
0.2	0.021	0.045 84	96 900	4.986 32	-5.338 76
0.25	0.039	0.074 13	146 900	5.167 02	-5.130 01
0.15	0.009	0.023 12	46 900	4.671 17	-5.636 01
0.2	0.021	0.045 84	96 900	4.986 32	-5.338 76
0.25	0.039	0.074 13	146 900	5.167 02	-5.130 01
0.15	0.009	0.023 12	46 900	4.671 17	-5.636 01
0.2	0.021	0.045 84	96 900	4.986 32	-5.338 76
0.25	0.039	0.074 13	146 900	5.167 02	-5.130 01
⋮					
0.3	0.097	0.167 47	196 900	5.294 24	-4.776 06

Table 6-1 (continuation table)

Gas supply pressure P_s (MPa)	Flow measurement M'(m^3/h)	Flow correction value M (m^3/s) × 10^{-4}	Pressure difference ΔP (Pa)	lgΔP	lg$M$
0.35	0.136	0.217 53	246 900	5.392 52	-4.662 48
0.4	0.171	0.254 85	296 900	5.472 61	-4.593 72
0.45	0.202	0.284 67	346 900	5.540 20	—

6.5 Conclusion

…

Chapter 7 Conclusion and Prospect

The conclusion of the dissertation is arranged separately as the last chapter of the main body of the paper.

The conclusion is a summary of the main results of the whole paper. In the conclusion, we should clearly point out the creative achievements or innovative point theory (including new insights and new points of view) of the content of this research should be clearly pointed out, as well as the outlook and conception of further research work in the direction of this research in the future, and the conclusion should not be written as an abstract of the paper. The content of the conclusion is generally less than 2000.

References

[1] 毛峡．绘画的音乐表现[A]．中国人工智能学会 2001 年全国学术年会论文集[C]．北京：北京邮电大学出版社,2001:739-740

[2] 张和生．地质力学系统理论[D]．太原：太原理工大学,1998

[3] Quagliano L G, Nather H. Up conversion of luminescence via deep centers in high purity GaAs and GaAlAs epitaxial layers[J]. Applied Physics Letters, 1984, 45(5):555

[4] Quagliano L G, Nather H. Up conversion of luminescence via deep centers in high purity GaAs and GaAlAs epitaxial layers[J]. Applied Physics Letters, 1984, 45(5):555

……

（SimSun, or Times New Roman, 12pt. Reference types and identification must follow GB3469 regulations, various types of references should be identified with square brackets and single letters after the title.）

Papers published in the period of Ph.D. education

1. Published academic papers

[1] ×××，×××. 部多孔质气体静压轴向轴承静态特性的数值求解[J]. 摩擦学学报，2007，38(12) :68~72(EI 收录号： 071510544816)

[2]

2. Patents applied for and obtained (this need not be listed in the absence of patents)

[1] ×××，×××. 一种温热外敷药制备方案：中国，88105607.3[P]. 1989-07-26.

3. Science and technology awards (not listed when no award is awarded)

[1] ×××，×××. ××静载下预应力混凝土房屋结构设计统一理论. 黑龙江省科学技术二等奖, 2007.

Note: If published academic papers are included in EI or SCI, please indicate the number of the papers included and the influencing factors of SCI papers. For academic papers received but not published, please indicate whether they are sources of EI or SCI.

(SimSun(宋体), or Times New Roman, 12pt, spacing line 1.25 line.)

Research Work in the period of Ph.D. education

[1]

[2]

Acknowledgement

I sincerely thank my mentor, Professor XXX, for his meticulous guidance. His words and deeds will benefit me all my life.

Thank you, Professor XXX, and all the teachers and students in the laboratory for their enthusiastic help and support!

Thank you for your financial support for this project.

(Times New Roman, 12pt; Paragraph Line Spacing: 1.25 line, Indent the first line by 2 characters)

Author's Brief Introduction

The year * month * day comes from * year * month * day.

The students were admitted to * University * Department * specialty * and graduated from * University * year * month undergraduate course and received * bachelor's degree.

He studied in * University * College (department) * subject and obtained * master's degree.

He studied in * University * Department * discipline and obtained * doctorate degree.

Award winners:

Working experience:

(Times New Roman, 12pt; Paragraph Line Spacing: 1.25 line, Indent the first line by 2 characters)

(The author's brief should generally include educational experience and work experience.)