

## “深耕理工领域 挖掘结构化标引数据价值”

—Inspec数据库服务“十五五”期间，中国理工科研聚焦方向。

IET英国工程技术学会 孙鹏宁

[thomassun@theiet.org](mailto:thomassun@theiet.org)

2026年5月



The Institution of  
Engineering and Technology

# The Institution of Engineering and Technology

The IET inspires, informs and influences the global engineering community to **engineer a better world.**

- 成立于1871年，最早名称为电报工程师学会 (Society of Telegraph Engineers)
- 2006年英国电气工程师学会 (IEE) 和国际工业工程师学会 (IIE) 合并，更名为英国工程技术学会 (IET)
- 欧洲最大的工程技术专业机构
- 非盈利会员组织，全球150多个国家拥有约16万名会员



## IET 知识服务与解决方案

IET Inspec



Inspec Analytics



iet.tv

## 高锟(Charles K. Kao) 是 IET (及其前身 IEE) 的 Fellow (会士)



1966年7月，英国标准电信实验室( STL )的英籍华人高锟( Charles K. Kao )博士和他的伙伴G.A.Hockham，在英国 Proc.IEE ( London )杂志上共同发表了一篇题为《光频率介质纤维表面波导》的论文。在论文中，高锟明确提出，只要解决了玻璃的纯度和成分等问题，就可以将玻璃制作成损耗低于20dB/km光纤，用于通信。高锟先生后来被人尊称为“光纤通信之父”。1966年也因此被称为光纤通信的诞生年。

# IET 电子书

- ◆ 兼具前沿发展与传统领域
- ◆ 学术研究与业界应用并重
- ◆ 世界知名机构的顶级作者:

• 剑桥大学 • 牛津大学 • 斯坦福大学 • 清华大学 • 瑞士联邦理工学院  
 • 美国可再生能源实验室(NERL) • ARM • 美国SmartWires公司 ... ..

1000+  
电子书

18+  
平均被引

## 重点系列

- Control, Robotics and Sensors
- Materials, Circuits and Devices
- Electromagnetic Waves
- Radar, Sonar and Navigation
- Energy Engineering
- ICT and Cybersecurity
- Healthcare Technologies
- Transportation

◆ 80%全美工程类排名前50高校已订阅IET电子书◆



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Citation Data from Scopus (2004 to Apr 2026)

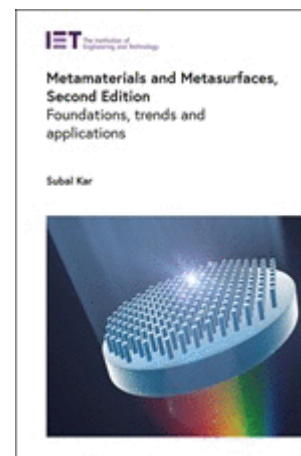
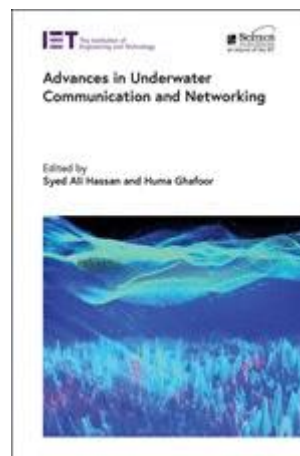
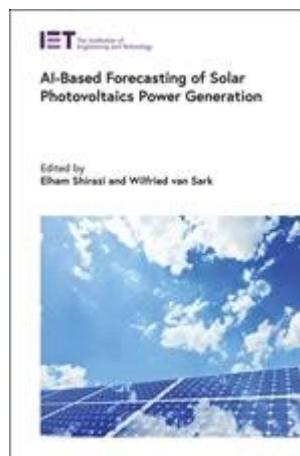
# IET电子书

**学科聚焦：**专注工程技术核心领域，覆盖电力能源、控制工程、通信、雷达导航、电子系统、人工智能、数字孪生、先进制造等，聚焦前沿技术与工程应用，贴合新工科、新质生产力研究方向。

**高影响力作者及机构：**IET 2025 电子书汇聚全球顶尖工科作者

（IEEE/IET Fellow、院士、高被引学者）与权威机构（世界名校 + 行业龙头），内容高度契合十五五“科技自立自强、新质生产力”战略方向，聚焦中国理工科院校科研核心需求。

## IET2025年电子书示例



# IET图书

- IET eBook最早可回溯至 1979 年，包括1000余种工程技术领域学术图书。这些应用和研究领域的学术专著为工程技术人员提供了工程科技领域新兴课题的新视角和新发展。

IET电子书引用情况统计（截止2026年5月）：

学科	图书数量	总被引次数	册均被引次数
雷达，声纳和导航	78	3676	47.13
能源工程	158	2859	18.09
电磁波	101	1305	12.92
计算机与网络	40	430	10.75
控制，机器人和传感器	94	945	10.05
医疗技术	26	230	8.85
材料，电路与器件	92	628	6.83
交通运输	21	79	3.76
信息安全	12	41	3.42
电信技术	78	242	3.1

2005年起图书收  
录比率

**88%**

被引比率

**72%**



数据来源：SCOPUS数据库

# 1. 初识Inspec数据库，从百年积淀到跨学科覆盖。

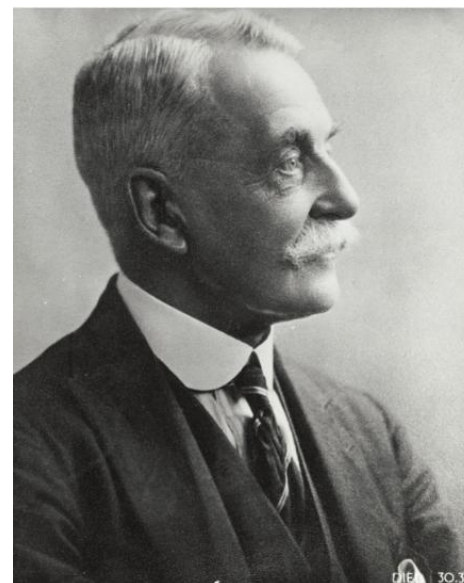
深耕垂直细分领域，为“物理”和“新工科”领域科研师生量身打造。

# Inspec 历史：1898 –

1898 年 1 月, 《科学文摘》 (*Science Abstracts*)

第一期出版, 包含 110 篇摘要, 分为 10 个部分:

- 一般物理学
- 电学和化学物理学
- 光
- 通用电气工程
- 热
- 发电机、电机和变压器
- 声音
- 配电、牵引和照明
- 电力
- 电报和电话



Sir James Swinburne, BART., F.R.S.

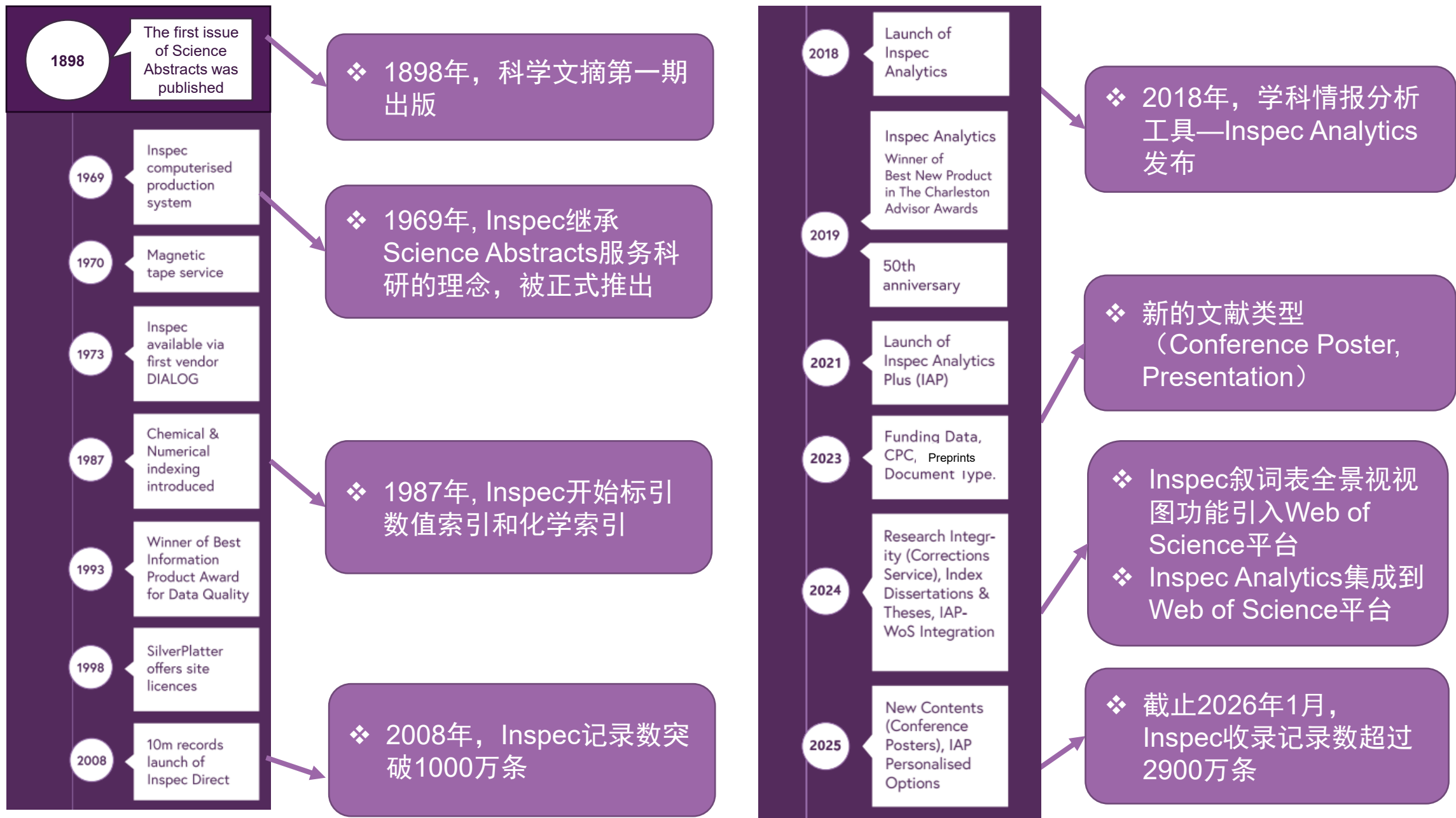


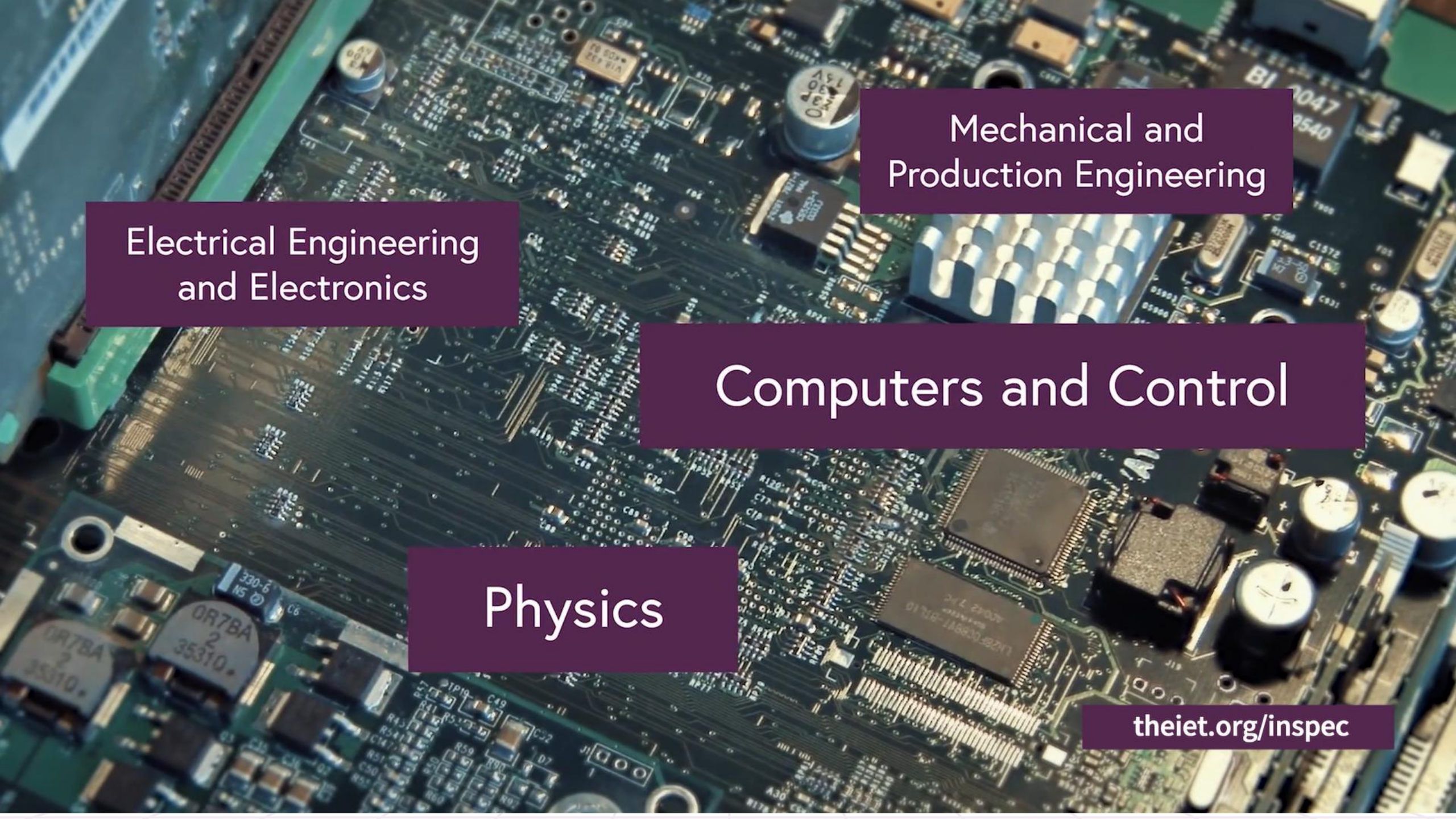
在第一年, 每月共出版 1,423 篇摘要, 并在年底增加了作者和学科索引。

作者索引中充满了杰出科学家的名字, 包括安培、贝克勒尔、玻尔兹曼、库仑、杜瓦、爱迪生、赫维赛德、赫兹、拉普拉斯、马可尼、麦克斯韦、迈克尔逊、佩罗和法布里、庞加莱、波克尔斯、普朗克、伦琴、西门子、汤普森、汤森、范德瓦尔斯和泽曼等。

*Science Abstracts* 是电气工程师学会 (IEE, IET前身) 和伦敦物理学会 (The Physical Society of London) 合作的成果, 他们成立了一个出版委员会来组织和管理摘要服务。名誉编辑, [James Swinburne](#) 爵士和一个庞大的索引团队被任命。

# Inspec (原Science Abstracts) 发展里程





Mechanical and  
Production Engineering

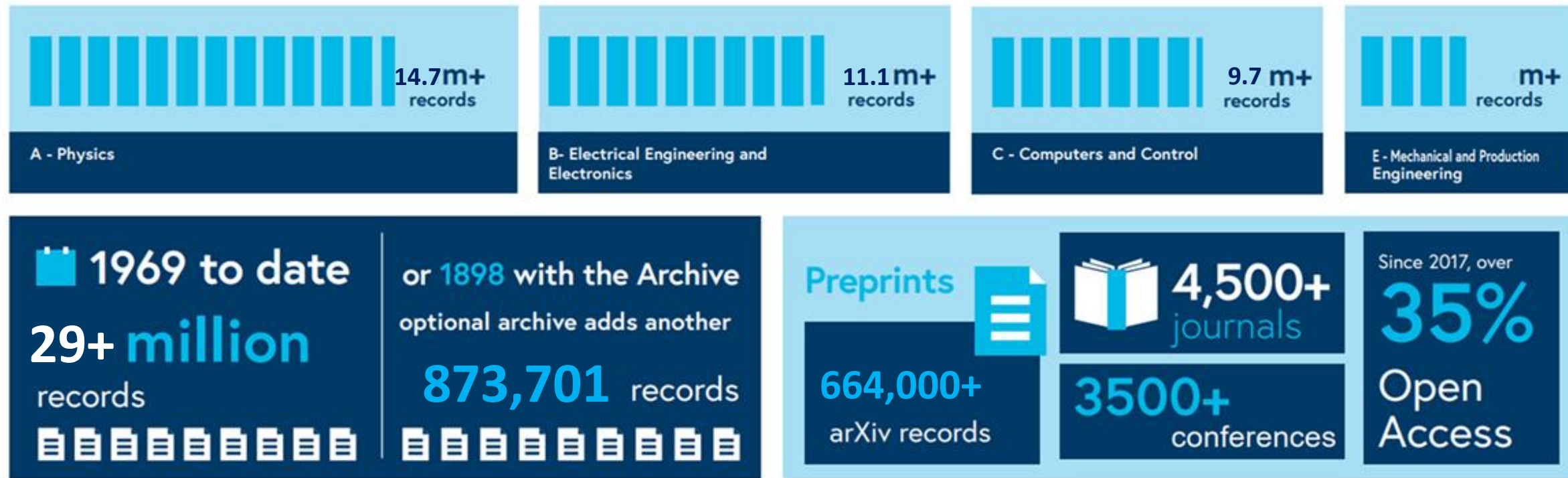
Electrical Engineering  
and Electronics

Computers and Control

Physics

[theiet.org/inspec](http://theiet.org/inspec)

# Inspec收录内容概览（学科、文献类型等）



- Inspec是全球最大的物理学和工程学领域的摘要分析数据库。
- Inspec的数据库评审团队由主题专家组成，他们以足够的认真和严格性对文章进行审核，以确保内容具有高质量和学科相关性。（[Inspec期刊列表-2026年4月](#)）。
- Inspec 的主题专家对每条收录记录进行严格的人工底层数据索引。
- Inspec 在 Web of Science和Engineering Village平台，为用户提供一站式的文献检索服务，使用Inspec叙词表功能高效获取研究主题知识框架，结合数值，化学等独有索引字段，实现精准高效文献检索。

# Inspec数据库收录的学科范围简介

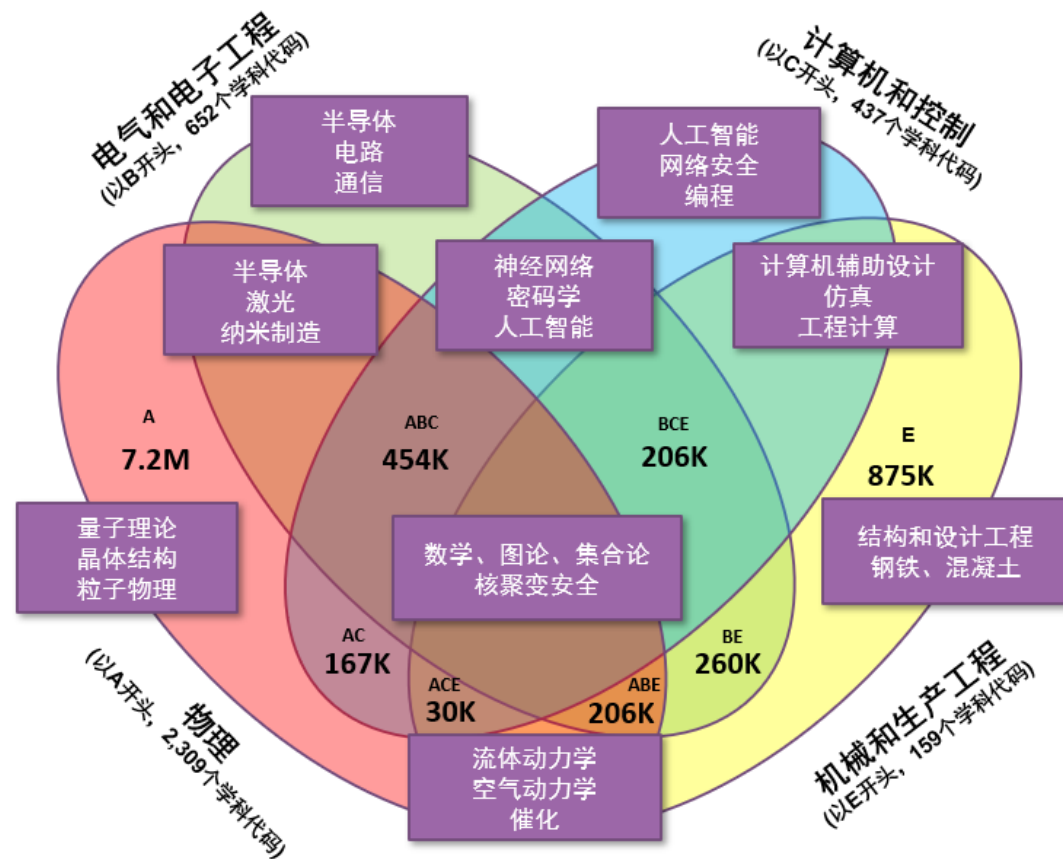
## （一）核心学科

- **物理学**：涵盖原子分子物理、核物理、**凝聚态物理**、光学、声学等多个分支领域
- **电气工程**：包括电力系统、电工技术、高电压技术、**分布式发电**等方向
- **电子与通信工程**：覆盖**6G通信技术**、信号处理、微波技术、半导体器件等方面
- **计算机科学**：包括计算机视觉与图像处理、人工智能、数据处理等领域
- **控制理论与工程**：包含**未来机器人**、自动控制、**智能无人系统技术**、系统工程等相关学科
- **生产与制造工程**：包括新能源汽车、增材制造、**高端装备**等方向

## （二）相关交叉学科

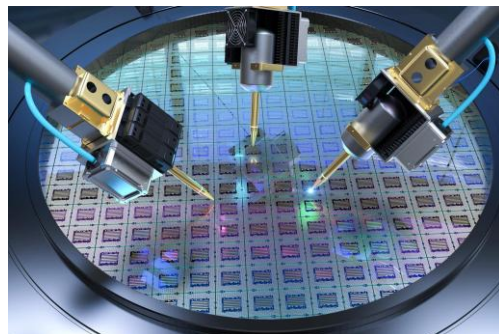
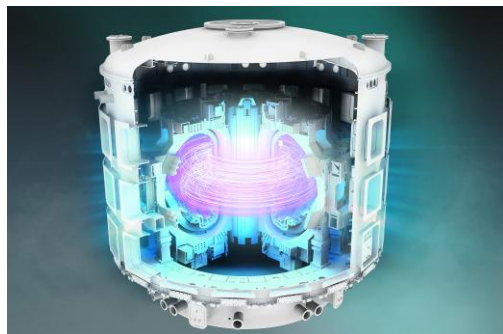
- **航空航天工程**：包括飞行器设计、**低空技术与工程**、航空电子、航空材料、**无人机技术**等研究领域
- **材料科学**：包括各类**电子信息材料**、工程材料、新型材料研发等领域
- **能源工程**：涵盖能源转换、能源存储、**可再生能源**等相关内容
- **生物医学工程**：融合生物学与工程技术的**医疗器械**、生物材料等方面

聚焦核心学科  
追踪“新工科”发展  
充分考虑学科交叉性  
有序扩展学科收录范围



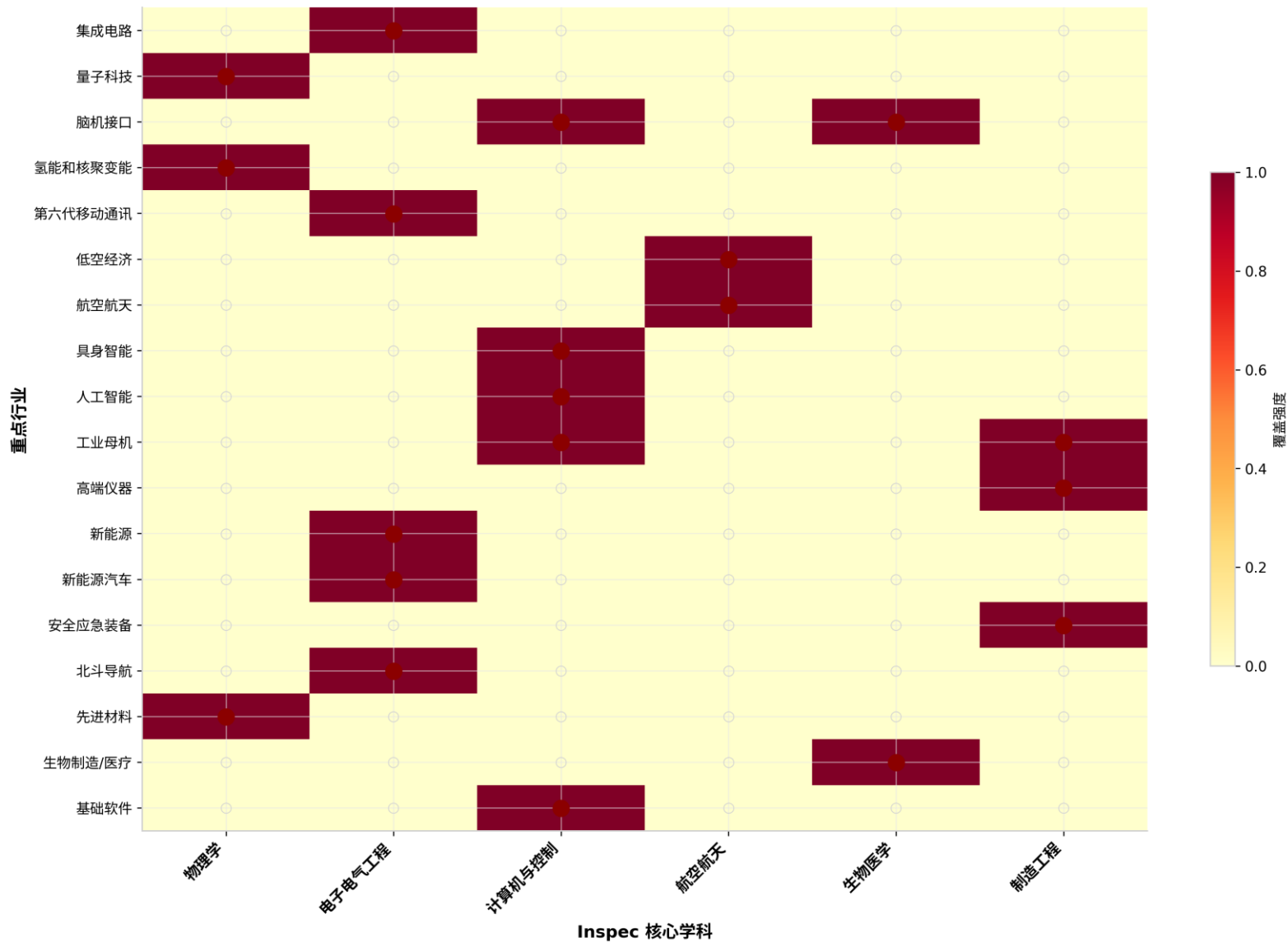
# Inspec收录内容聚焦国家规划重点行业

序号	“十五五”国家规划重点行业	Inspec核心控词 (Primary Thesaurus Terms)
1	集成电路	integrated circuits; microelectronics; semiconductor devices; VLSI; CMOS technology; chip design
2	量子科技	quantum computing; quantum information processing; quantum optics; quantum cryptography; quantum entanglement
3	脑机接口	brain-computer interfaces; neural engineering; biosensors; neuroprosthetics; EEG signal processing
4	氢能和核聚变能	hydrogen energy; fuel cells; nuclear fusion; plasma physics; tokamak devices; energy storage
5	第六代移动通信	6G mobile communication; terahertz waves; millimetre wave communication; MIMO communication; wireless communication
6	低空经济	unmanned aerial vehicles; air traffic control; avionics; autonomous navigation; aerospace electronics
7	航空航天	aerospace engineering; space vehicles; satellite communication; propulsion systems; reusable launch vehicles
8	具身智能	robotics; autonomous robots; humanoid robots; machine learning; computer vision; sensor fusion
9	人工智能	artificial intelligence; deep learning; neural networks; natural language processing; computer vision; pattern recognition
10	工业母机	machine tools; CNC machines; precision engineering; manufacturing automation; mechatronics; smart manufacturing
11	高端仪器	measurement instruments; precision measurement; optical instruments; scientific instruments; sensors; metrology
12	新能源	solar cells; wind power; energy storage; power electronics; smart grids; photovoltaic systems
13	新能源汽车与智能网联汽车	electric vehicles; autonomous vehicles; intelligent transportation systems; battery management; V2X communication; ADAS
14	安全应急装备	emergency management; disaster relief; safety engineering; rescue robots; hazard detection
15	北斗与高端导航通信设备	satellite navigation; GNSS; BeiDou navigation; positioning systems; inertial navigation
16	先进材料	nanomaterials; semiconductor materials; photonic materials; energy materials; composite materials; materials science
17	生物制造/高端医疗装备	biotechnology; biomedical engineering; medical devices; tissue engineering; diagnostic imaging; biopharmaceuticals
18	基础软件	software engineering; operating systems; database management; cloud computing; cybersecurity; big data



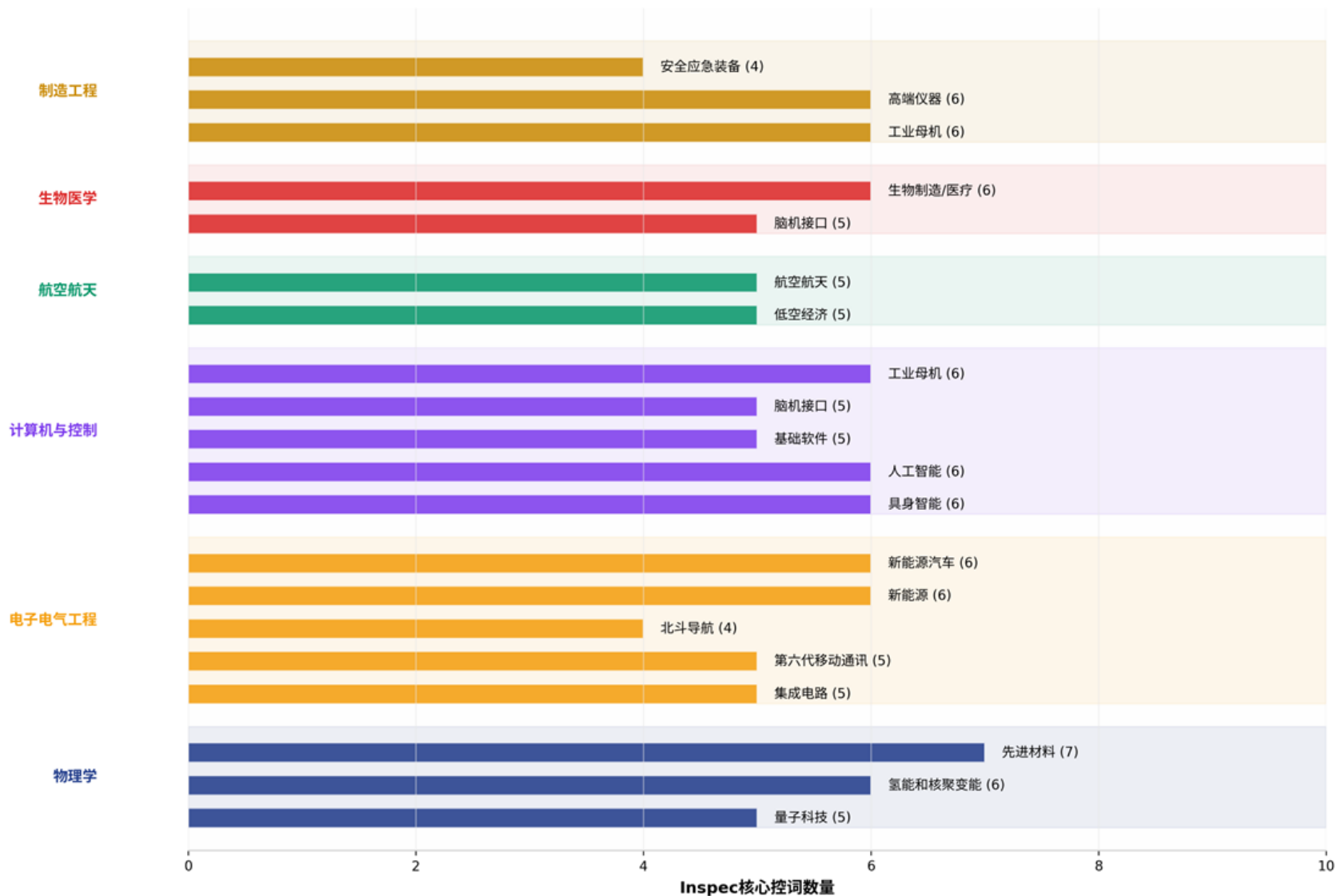
# Inspec收录内容聚焦国家规划重点行业

"十五五"重点行业 × Inspec学科 覆盖矩阵



# Inspec收录内容聚焦国家规划重点行业

"十五五"重点行业按Inspec学科聚类分布

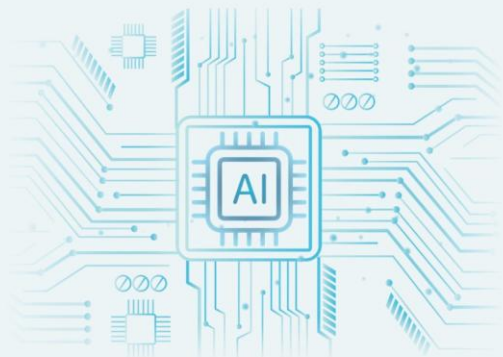


# IET INSPEC

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- ◆ 历经50年广受认可的Inspec专家叙词表体系
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滤除 80% - 90%+ 检索噪音

唯一将论文与专利分类代码(IPC & CPC)  
关联的非专利文献数据库

Trusted content and expert indexing to support enhanced discovery and precision analytics

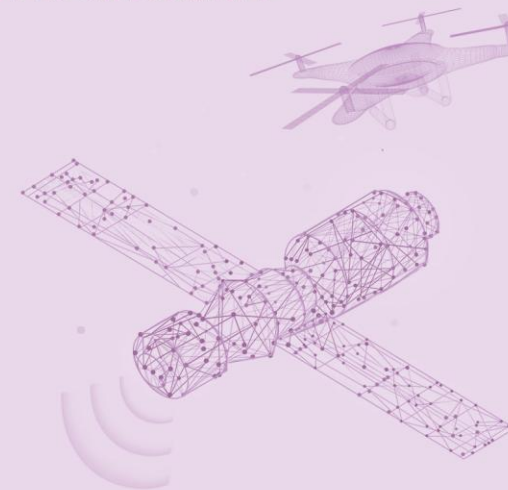


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关联的非专利文献数据库

Trusted content and expert indexing to support enhanced discovery and precision analytics



## 可信的数据源

Inspec 是一个权威的、践行出版商中立原则的文摘与分析数据库。

- IEEE, ACM, IOP, AIP, APS等出版商内容被全面覆盖
- 发现来自全球出版物的最新研究，经过质量和学科相关性筛选
- 由主题专家进行细致的索引，对期刊标题进行主题分析
- 定期更新的主题分类和叙词表，反映最新的研究领域
- 严谨的期刊遴选流程和透明公开的期刊遴选标准
- 定期重新评估期刊和会议标题列表，关注标题的质量和范围，动态新增和剔除机制

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7 million+  
会议论文

(3,500+ 每年举办的学术会议)

## 2. 精通Inspec数据库检索， 底层索引字段+实操案例拆解。

- 超过50年被广泛认可的Inspec专家叙词表体系（物理和工程学词表）
- 独有的数值与化学索引， 专利分类、 文档处理代码等标引
- 滤除80%-90%+检索噪音

# Inspec的精准人工专家索引

(结构化数据字段, 突破自然语言检索困境。)

## Bibliographic Record (书目记录)

- Title (标题)
- Abstract (摘要)
- Other Bibliographic Information (其他书目信息)
- (Author, Source, etc.) (作者、作者关键词、出版物标题等)

出版社  
元数据

## Subject Terms (学科术语)

- Consistent thesaurus maintained by subject experts for over 50 years (学科专家50年来维护的一致性的叙词表)
- Controlled Index – 5 levels of subject classification and >10k controlled terms (1万多受控关键词)
  - Uncontrolled Index – curated by expert indexers (标引专家挑选的非受控关键词)

INSPEC  
人工数据专家  
添加的  
底层数据  
字段

## Special Indexes (特殊索引)

- Classification Codes (学科分类)
- Treatment Codes (文档处理类型)
- Chemical Indexing (化学索引)
- Numerical Data Indexing (数值索引)
- Astronomical Object Indexing (天文学物体对象索引)
- Patent Classification Codes (专利分类代码)

# 被Inspec收录 — 多维度的揭示，最大化的可见度

国际专利分类	H01Q Aerials; H03F Amplifiers; H03F3/20 Power amplifiers, e.g. class b amplifiers, class c amplifiers; H01L29/778 with two-dimensional charge carrier gas channel, e.g. HEMT	揭示非专利文献的专利方向，助力科研成果转化
化学物质索引	SiC/int Si/int C/int SiC/bin Si/bin C/bin; AlGaIn-GaN/int AlGaIn/int GaN/int Al/int Ga/int N/int AlGaIn/ss Al/ss Ga/ss N/ss GaN/bin Ga/bin N/bin	揭示文章中重要的物质
学科分类代码 <sup>①</sup>	B1220 ▾ Amplifiers; B5270B ▾ Single antennas; B1350H ▾ Microwave integrated circuits	揭示学科方向
CODEN	IETMAB	
受控词表 <sup>①</sup>	aluminium compounds ▾ ; gallium compounds ▾ ; high electron mobility transistors ▾ ; III-V semiconductors ▾ ; millimetre wave antennas ▾ ; millimetre wave power amplifiers ▾ ; MMIC power amplifiers ▾	揭示文章的核心主题
非受控词表	Ka-band MMIC amplifier; high electron-mobility transistor; monolithic-microwave integrated-circuit; millimeter-wave antenna; continuous wave saturated output power; RF power stress test; HEMT; Ka-band power amplifier; millimeter-wave monolithic microwave integrated circuit; 10 GHz; 26 to 36 GHz; 5 W; 50 ohm; 191 C; 1000 h; AlGaIn-GaN; SiC	揭示作者的重要术语表述
语种	English	
入藏号	INSPEC:9214414	
ISSN	0018-9480	
处理类型	Practical	揭示论文的研究方法
数值数据索引	frequency 1.0E+10 Hz; power 5.0E+00 W; frequency 2.6E+10 to 3.6E+10 Hz; time 3.6E+06 s; resistance 5.0E+01 ohm; temperature 4.64E+02 K	揭示文章重要的数值参数

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Abstract

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Bibliographic Information



Inspec • Conference article (CA)

## Multi-stage registration and feature based robust and precise LiDAR SLAM

*SAE Technical Papers, Issue 369912, Pages 2025-01-7161, 2025*

[Li, Z.](#) <sup>[1]</sup>; [Tong, P.](#) <sup>[1]</sup>; [Shi, W.](#) <sup>[1]</sup>; [Bi, X.](#) <sup>[1]</sup>

**Author affiliation:**

[1] Tongji University

**Accession number**

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**Publisher**

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**ISSN**

2688-3627

**DOI**

10.4271/2025-01-7161

## Abstract

In a complex and ever-changing environment, achieving stable and precise SLAM (Simultaneous Localization and Mapping) presents a significant challenge. The existing SLAM algorithms often exhibit limitations in design that restrict their performance to specific scenarios; they are prone to failure under conditions of perceptual degradation. SLAM systems should maintain high robustness and accurate state estimation across various environments while minimizing the impact of noise, measurement errors, and external disturbances. This paper proposes a three-stage method for registering LiDAR point cloud. First, the multi-sensor factor graph is combined with historical pose and IMU pre-integration to provide a priori pose estimation; then a new method for extracting planar features is used to describe and filter the local features of the point cloud. Second, the normal distribution transform (NDT) algorithm is used as coarse registration. Third, the feature to feature registration is used for fine registration to achieve iterative optimization of pose. This method also publishes high-frame-rate real-time pose data through IMU, achieving the simultaneous improvement of registration convergence speed, robustness, precision and real-time performance. In addition, this method is suitable for a variety of application scenarios of mechanical and solid-state LiDARs. In terms of experimental verification, this paper uses M2DGR dataset and outdoor testing to verify the precision of the algorithm. The ablation experiments of coarse registration and fine registration are carried out respectively to illustrate the importance of different stages. The results show that the multi-stage registration method is beneficial to improve the precision and robustness of the algorithm.

## Related documents

Journals

**An Accurate LiDAR-Inertial SLAM Based on Multi-Category Feature Extraction and Matching**

[Li, N.](#); [Yao, Y.](#); [Xu, X.](#); [Zhou, S.](#); [Yang, T.](#)

(2025) *Remote Sensing*

Database: *Inspec*

**DJPETE-SLAM: Object-Level SLAM System Based on Distributed Joint Pose Estimation and Texture Editing**

[Yuan, C.](#); [Wang, D.](#); [Li, Z.](#); [Xu, Y.](#); [Zhang, Z.](#)

(07 March 2025) *Electronics*








Database: *Inspec*

Feedback

# Inspec记录在Engineering Village平台

## Indexing


### Inspec controlled terms: • 控制词

feature extraction  image registration  iterative methods  mobile robots   
normal distribution  optical radar  pose estimation  robot vision   
SLAM (robots) 


### Uncontrolled terms: • 非控制词


accurate state estimation coarse registration existing SLAM algorithms external disturbances  
feature registration fine registration high-frame-rate real-time IMU pre-integration LiDAR point cloud  
local features measurement errors multisensor factor graph multistage registration method  
normal distribution perceptual degradation planar features precise LiDAR precise SLAM  
real-time performance registration convergence speed robust LiDAR simultaneous improvement  
SLAM systems solid-state LiDARs stable SLAM three-stage method


### Inspec classification codes:


C3390C Mobile robots 


### • 学科分类

C4130 Interpolation and function approximation (numerical analysis) 

C5260B Computer vision and image processing techniques 

B6135E Image recognition 

B6135 Optical, image and video signal processing 

B6320C Optical radar 

### Treatment:

Practical (PRA); Theoretical or Mathematical (THR)

## Patent Information

**IPC Codes:** G06T - G05D1/00 - G01S17/00

**CPC Codes:** G01S17/00 - G05D1/00 - G06T

## Metrics

### Scopus

17

Citations

4

Authors

### PlumX Metrics

1

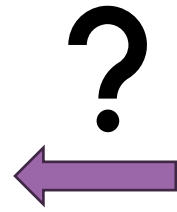
Citations

Powered by PlumX Metrics

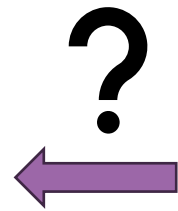
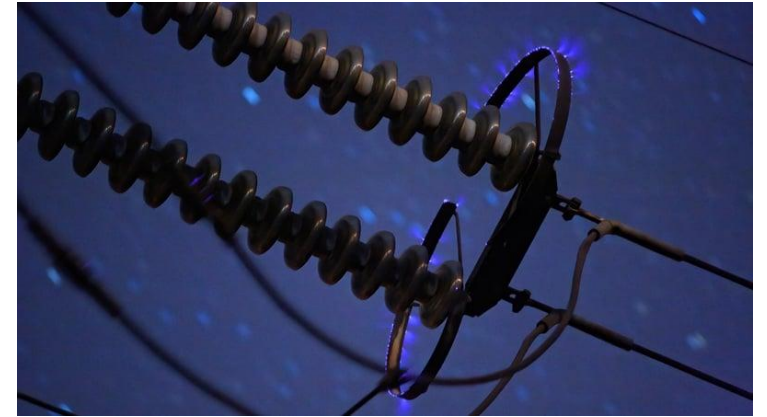
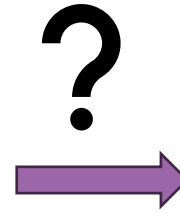


[See all PlumX details](#)

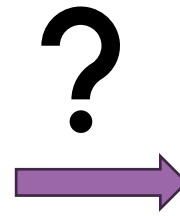
# 如何解决自然语言与学术术语之间的歧义？



电晕



法兰



"同一个词，完全不同的世界。当研究者搜索'电晕'时，可能找到医学文献，也可能找到高压输电论文——这就是自然语言与学术术语的歧义问题。"

# 如何解决自然语言与学术术语之间的歧义？

—— 从“一词多义”到“精准定位”的学术检索革命

## 检索痛点

- ⚠ 搜索“电晕” → 医学论文 + 电力论文混杂
- ⚠ 搜索“法兰” → 历史文献 + 机械图纸混杂
- ⚠ 同一个词，10个学科10种含义
- ⚠ 检索结果噪声高达80-90%

自然语言的“歧义性” = 学术检索的“灾难性”

## 歧义案例对比

### 电晕

医学：头晕症状  
工程：高压放电  
完全不同的概念！

### 法兰

历史：法兰克王国  
机械：管道连接件  
完全不同的概念！

VS

## 如何快速判断语义？

### 医学语义

患者/症状/治疗/就诊

### 工程语义

高压/绝缘/放电/输电

### 历史语义

王国/中世纪/查理曼

关键词上下文 = 语义判断的“金钥匙”

## 学科分类体系



## Inspec 解决方案：控制词表（Thesaurus）三重消歧机制

### ID

#### ① 唯一标识符

- 每个概念分配唯一编码
- 如：电晕(医学)=C1234
- 电晕(工程)=E5678
- 从根本上区分语义

消除“一词多义”

### CLS

#### ② 学科分类代码

- 5级学科分类体系
- 3600+细分学科标签
- 自动限定检索领域
- 物理/医学/历史不混淆

限定检索范围

### CTX

#### ③ 上下文标引

- 记录术语专业语境
- 关联相关概念网络
- 如：电晕→绝缘子/高压
- 法兰→管道/密封/螺栓

精准语义定位

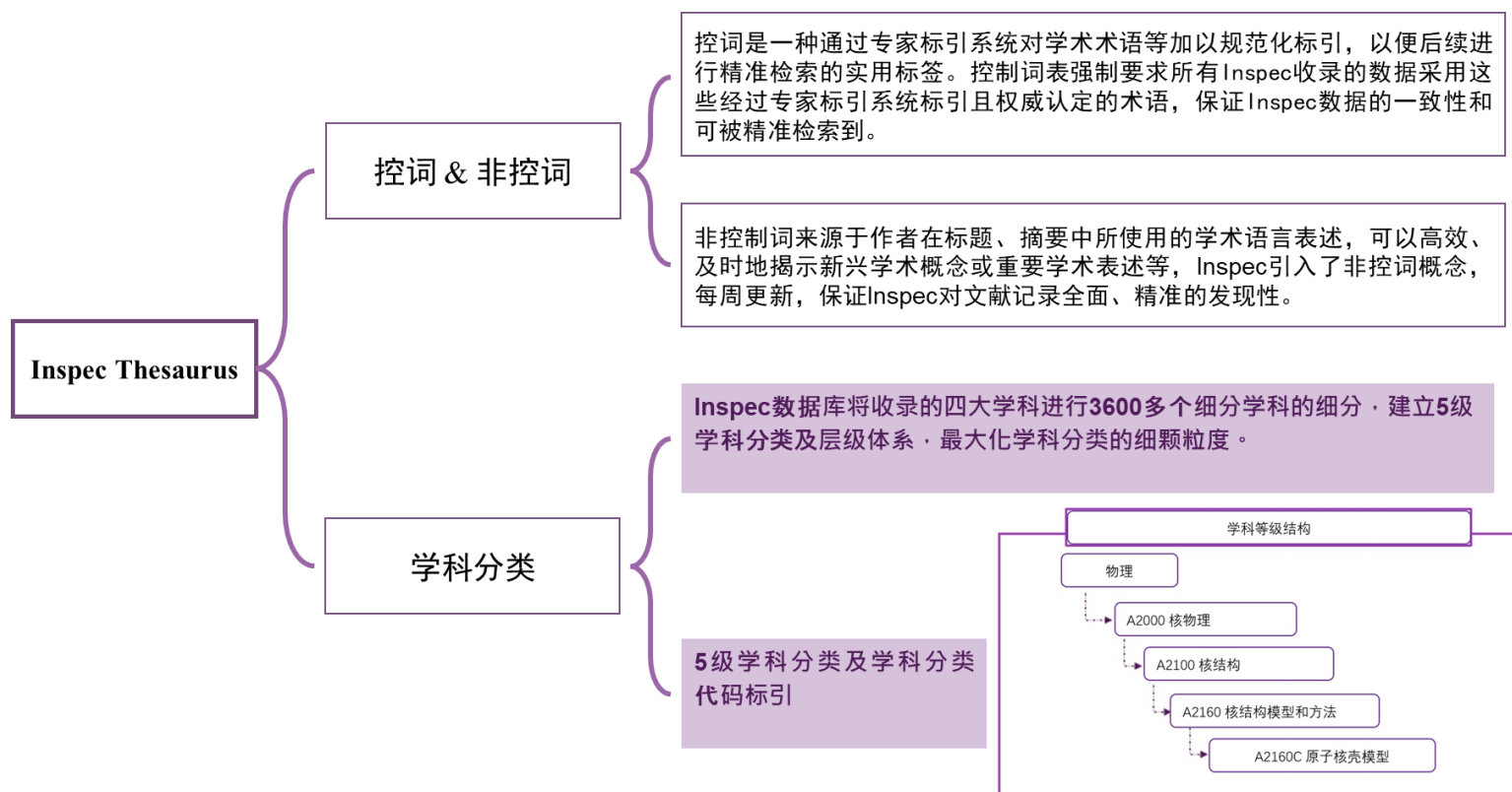
效果：检索噪声降低 80-90% → 从“大海捞针”到“精准命中”

# 标准化控词—对初阶科研人员，如何查准规范的学术用语？

由于语言，文化，习惯，技术迭代，导致的表述语言的不太一致，Inspec叙词表标准化了工程术语。

作者没有提及的概念，被学科专家标引出来（拓展应用领域，研究范畴）。

## Inspec底层数据深度加工—叙词表



# Inspec底层数据深度加工—叙词表

Inspec工程叙词表（Engineering Thesaurus）是一种专门用于工程领域的标准化词汇表。其旨在通过主题分析辨识论文的知识内涵，分析其特点，使用规范化的词汇描述其主题。叙词表种包含特定学科领域的词汇，并以特定的结构排列，以显示出词汇之间关系，即语义上的从属或并列关系。

## 非专业词汇到专业词汇

The screenshot displays the Inspec search interface. On the left, a search query for "CMOS" is shown, resulting in 31 items. Below the search bar, a list of related terms is provided, each with an "Add" button and a help icon:

- analogue processing circuits
- analogue storage
- application specific integrated circuits
- BiCMOS integrated circuits
- CCD image sensors
- charge pump circuits

The main part of the image shows a detailed record for a publication. The record includes the following information:

- Author Information:** Wang, Shian; Liang, Yuhua; Zhang, Yanbo; Zhu, Zhangming; Key Lab. of Analog Integrated Circuits & Syst. (Minist. of Educ.), Xi'dian Univ., Xi'an, China
- Categories/ Classification:** Research Areas: Engineering; Mathematics; Instruments & Instrumentation; Computer Science (provided by Clarivate)
- International Patent Classification:** G01D18/00 Testing or calibrating of apparatus or arrangements provided for in groups G01D1/00 to G01D15/00; G12B13/00 Calibrating of instruments or apparatus; H03M1/12 Analogue/digital converters; G01R31/3187 Built-in tests
- Subject Classification codes:** B1265H A/D and D/A converters; B0290F Interpolation and function approximation (numerical analysis); B2570D CMOS integrated circuits; B7130 Measurement standards and calibration; C4130 Interpolation and function approximation (numerical analysis); C5180 A/D and D/A converters
- CODEN:** ITCSCH
- Controlled Terms:** analogue-digital conversion; built-in self test; calibration; CMOS integrated circuits; computational complexity; discrete Fourier transforms; iterative methods; table lookup
- Uncontrolled Terms:** accurate digital estimation; calibration accuracy; capacitor mismatch-induced nonlinearity; DFT-IDFT-based minimum-segment calibration technique; digital calibration methods; greatly simplifying ADC error extraction; incoherent sampling conditions; iteration-based methods; minimum-segment approach; multiterm cosine-sum window functions; multiterm cosine-sum windows-assisted DFT-IDFT-based minimum-segment calibration; noise figure 27.3 dB; nonlinear bit-weight errors; one-shot error extraction method; SAR ADCs; suppressing spectral leak-age
- Funding:** National Key Research and Development Program of China; National Natural Science Foundation of China

On the right side of the record, there is a sidebar with the following information:

- MICROELECTRONICS JOURNAL**
- Use in Web of Science:** 9 Last 180 Days, 9 Since 2013
- This record is from:** Inspec®
- Suggest a correction:** If you would like to improve the quality of the data in this record, please [Suggest a correction](#)

# 在WoS平台如何使用Inspec叙词表

The screenshot displays the Clarivate Web of Science search interface. At the top, the Clarivate logo and 'Web of Science™' are visible, along with navigation options for '简体中文' (Simplified Chinese) and '产品' (Products). The search bar contains the term 'AI', and the results section shows '16 条结果: "AI"'. A modal window titled '返回检索' (Return Search) is open, displaying a list of related terms with '添加' (Add) buttons. The terms include: AI chips, application specific integrated circuits, artificial intelligence, coprocessors, field programmable gate arrays, graphics processing units, hardware accelerators, learning (artificial intelligence), microprocessor chips, and multiprocessing systems. To the right of the modal, a detailed view of the 'programmable logic arrays' term is shown, including its 'Prior Term(s)' (logic arrays) and 'Related Term(s)' (AI chips, field programmable analogue arrays, hardware accelerators, reconfigurable architectures). The modal includes buttons for '清除' (Clear) and '添加到检索式' (Add to Search Query). The footer contains the Clarivate logo, 'Accelerating innovation', copyright information '© 2025 Clarivate', and links for '数据修正' (Data Correction), '版权声明' (Copyright Statement), '管理 cookie 首选项' (Manage Cookie Preferences), and '关注我们' (Follow Us).

# 在WoS平台如何查看Inspec叙词表

< 返回检索

添加 document image processing ?

> 添加 image motion analysis ?

添加 image enhancement ?

添加 image thinning ?

^ 添加 image recognition ?

添加 edge detection ?

添加 image classification ?

添加 face recognition ?

> 添加 **gesture recognition** ?

添加 iris recognition ?

添加 optical character recognition ?

添加 fingerprint identification ?

添加 image matching ?

添加 pose estimation ?

添加 ... ?

8. 控词树状结构图

Top Term(s)

- o 添加 pattern recognition (H)
- o 添加 signal processing (H)
- o 添加 user interfaces (H)

Date of Input

- o January 1999

Related Classification Code(s)

- o B6135E
- o C0140
- o C0240
- o C1250M
- o C5260B
- o C6180
- o G06K9/00

9. Inspec学科分类号

× 清除

添加到检索式

# 在Engineering Village平台使用Inspec叙词表 (Thesaurus)

The screenshot displays the Engineering Village website interface. At the top, the logo for Engineering Village (Elsevier) is on the left, and navigation links for Search, Search History, Alerts, Selected records, and More are on the right. Below the navigation bar, there is a search bar with a dropdown menu for 'Thesaurus search' set to 'Vocabulary search' and a search input field containing 'e.g. computer simulation'. The database selection is set to 'Inspec'. A dropdown menu is open, showing options: Quick, Expert, Thesaurus, Author, Affiliation, Engineering Research Profile, and Inspec Analytics. A purple box highlights the 'Thesaurus' option, with an arrow pointing to a callout box containing the text '点击“Thesaurus”进入叙词表'. Below the search bar, there is a section for 'Inspec Analytics' with a list of features: 'Monitor the research trends', 'Benchmark an institution to find collaborators', and 'Monitor global trends for over 14,000 research topics to explore new fields and find collaborators'. At the bottom, there is a 'Did you know?' section with two columns of text and buttons for 'Try Quick search' and 'Try Expert search'.

Engineering Village

Thesaurus search: Vocabulary search for e.g. computer simulation

Database:  Compendex  Inspec

Quick  
Expert  
Thesaurus  
Author  
Affiliation  
Engineering Research Profile  
Inspec Analytics

点击“Thesaurus”进入叙词表

**Did you know?**  
You can now search a year range and specify any start or end year. This new feature will be especially useful when saving a search alert to return results for any end year, not just the current year.

On Quick search: select the "Date" search option and then select "Latest" for the end year.

On Expert search: use an asterisk in the "YR" field to indicate an open range. Example: "artificial intelligence AND (2000-\* WN YR)"

Try Quick search Try Expert search

# 在Engineering Village平台使用Inspecc叙词表

Thesaurus search:

Vocabulary search ▼

for

autonomous vehicles



Database:

Inspecc

以输入首选术语“自动驾驶汽车”为例

## Exact term results ^

autonomous vehicles > mobile robots

mobile robots

For: autonomous marine vehicles; connected and autonomous vehicles; delivery robots; drones; one-wheeled balancing robots; RoboCup; two-wheeled balancing robots; UAV; wheeled robots

### Prior terms

- industrial robots
- robots

### Top terms

- automation

### Related terms

- advanced driver assistance systems
- aerospace robotics
- agricultural robots
- assistive robots
- automatic guided vehicles
- autonomous aerial vehicles
- autonomous driving
- autonomous underwater vehicles
- collision avoidance
- humanoid robots
- industrial robots
- inspection
- laser ranging
- marine control
- marine robots
- microrobots
- military robotics
- motion sensors
- path planning
- planetary rovers

### Broader terms

- robots

### Narrower terms

- automatic guided vehicles
- legged locomotion
- remotely operated vehicles
- rescue robots
- unmanned ground vehicles

Selected term(s) >

Select term by using the checkboxes or find additional terms by clicking on the term...

AND  
 OR

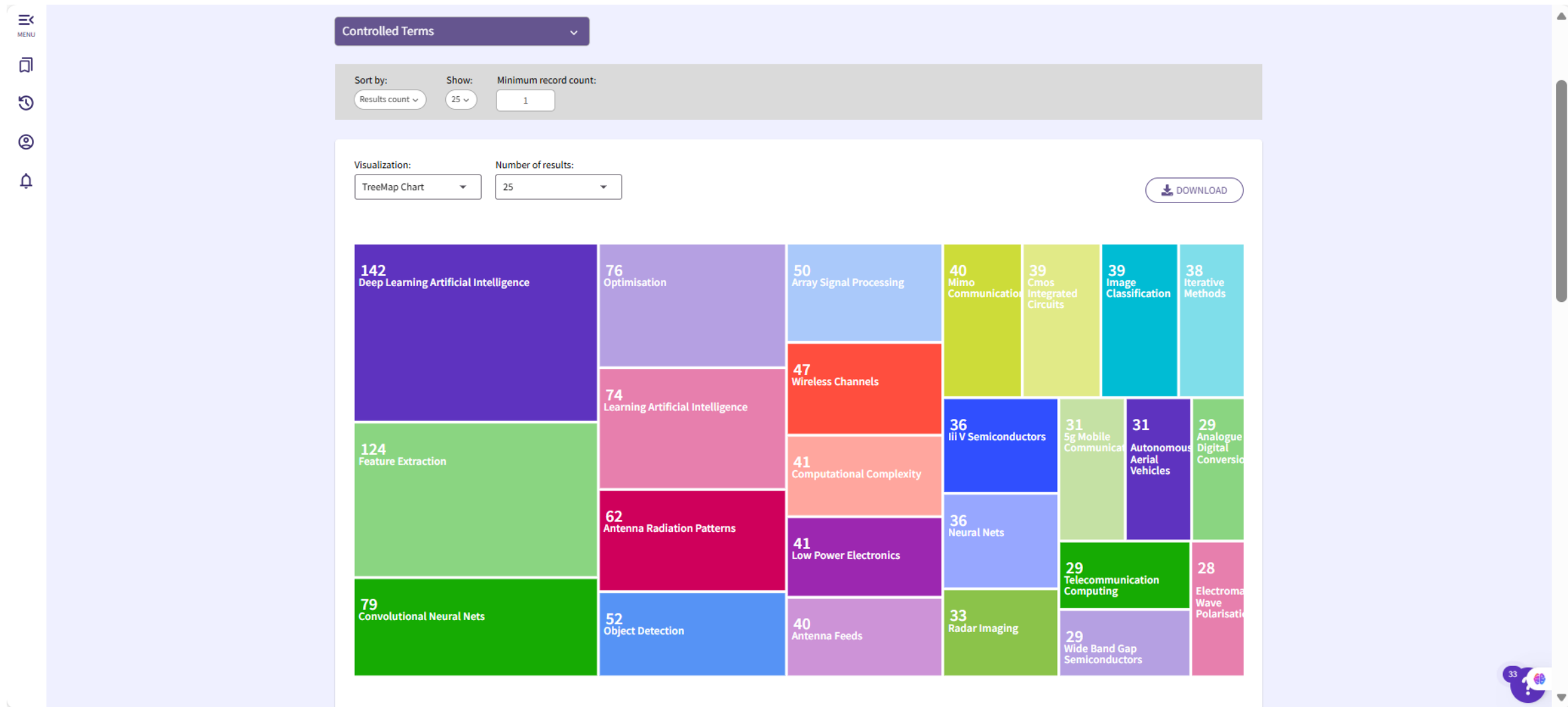
Reset form



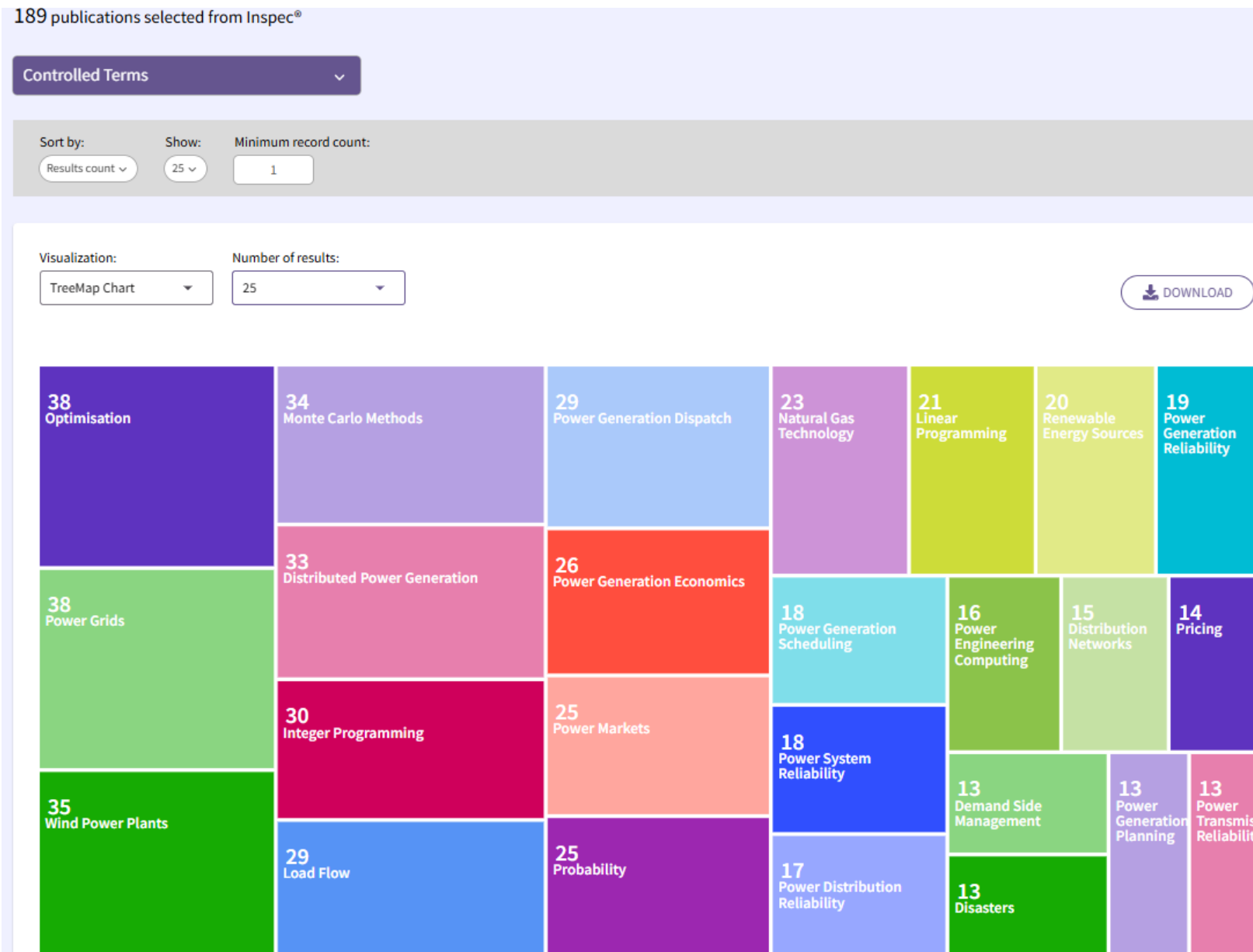


# 通过Inspec叙词表，找准投稿期刊

以近2023-2025年发表在<Electronics Letters>（ISSN 1350-911X）的1,082篇文章为例，通过Inspec受控词分析发文主题，辅助投稿期刊判断。



# 通过Inspec叙词表，分析科研人员的发文主题/研究领域（细分）



# Inspec叙词表的作用—精炼检索结果

以近10年发表的关于“空芯光纤的光传播色散与衰减与光纤包层折射率相关性”的研究为例

1,373

1,373 条来自 Inspec®的结果:

Q "Hollow Core Fiber" (主题) and 2016-2026 (出版年)



通过Inspec学科分类和受控词进行快速的文献精炼

返回所有过滤条件 导出为 Excel

精炼依据分类

检索分类

全选

<input type="checkbox"/> Fibre Optics	1,000	<input type="checkbox"/> Hygrometry	26	<input type="checkbox"/> Applied Fluid Mechanics	6
<input type="checkbox"/> Fibre Optic Sensors Fibre Gyros	543	<input type="checkbox"/> Mechanical Effects Of Light	26	<input type="checkbox"/> Cellular Biophysics	6
<input type="checkbox"/> Fibre Optic Amplifiers	317	<input type="checkbox"/> Optical Solitons	26	<input type="checkbox"/> Computer Vision And Image Processing Techniques	6
<input type="checkbox"/> Optical Propagation Dispersion And Attenuation In Fibres	292	<input type="checkbox"/> Magnetic Variables Measurement	25	<input type="checkbox"/> Haemodynamics Pneumodynamics	6
<input type="checkbox"/> Optical Fibre Fabrication Cladding Splicing Joining	383	<input type="checkbox"/> Optical Sources And Standards	25	<input type="checkbox"/> Ir Spectroscopy And Spectrometers	6
<input type="checkbox"/> Other Fibre Optical Devices And Techniques	292	<input type="checkbox"/> Optical And Laser Radiation Biomedical Imaging Measurement	24	<input type="checkbox"/> Optical Shutters Windows Diaphragms Deflectors Choppers And Scanners	6
<input type="checkbox"/> Laser Beam Modulation Pulsing And Switching Mode Locking And Tuning	260	<input type="checkbox"/> Optical Communication	24	<input type="checkbox"/> Cozlasers	5
<input type="checkbox"/> Optical Materials	247	<input type="checkbox"/> Laser Resonators And Cavities	23	<input type="checkbox"/> Data Security	5
<input type="checkbox"/> Optical Interferometry	237	<input type="checkbox"/> Microwave Photonics	23	<input type="checkbox"/> Detection Of Radiation Bolometers Photoelectric Cells R And Submillimetre Waves Detection	5
<input type="checkbox"/> Ultrafast Optical Techniques	231	<input type="checkbox"/> Optical Polymers And Other Organic Optical Materials	23	<input type="checkbox"/> Energy Conversion Spectroscopic Methods Of Chemical Analysis	5
<input type="checkbox"/> Design Of Specific Laser Systems	193	<input type="checkbox"/> Semiconductor Lasers	23	<input type="checkbox"/> Liquid Crystal Devices	5
<input type="checkbox"/> Fibre Lasers And Amplifiers	188	<input type="checkbox"/> Fibre Optics And Fibre Waveguides	22	<input type="checkbox"/> Magnetic Materials	5
<input type="checkbox"/> Chemical Sensors	153	<input type="checkbox"/> Lasing Action In Other Gas Lasers	22		

取消 排除 精炼 33



精炼依据 受控词表

检索 受控词表

全选

<input type="checkbox"/> Optical Fibre Losses	312	<input type="checkbox"/> Spectrochemical Analysis	7	<input type="checkbox"/> Nanostructured Materials	3
<input type="checkbox"/> Optical Fibre Fabrication	129	<input type="checkbox"/> Ytterbium	7	<input type="checkbox"/> Optical Delay Lines	3
<input type="checkbox"/> Hollow Fibres	128	<input type="checkbox"/> Argon	6	<input type="checkbox"/> Optical Fibre Theory	3
<input checked="" type="checkbox"/> Optical Fibre Cladding	108	<input type="checkbox"/> Arsenic Compounds	6	<input type="checkbox"/> Optical Frequency Combs	3
<input type="checkbox"/> Optical Design Techniques	86	<input type="checkbox"/> Erbium	6	<input type="checkbox"/> Optical Resonators	3
<input type="checkbox"/> Fibre Optic Sensors	84	<input type="checkbox"/> Fabry Perot Interferometers	6	<input type="checkbox"/> Plasmonics	3
<input type="checkbox"/> Photonic Crystals	82	<input type="checkbox"/> Gold	6	<input type="checkbox"/> Quantum Entanglement	3
<input type="checkbox"/> Optical Fibre Dispersion	79	<input type="checkbox"/> Laser Cavity Resonators	6	<input type="checkbox"/> Quartz	3
<input type="checkbox"/> Optical Fibre Polarisation	54	<input type="checkbox"/> Light Polarisation	6	<input type="checkbox"/> Red Shift	3
<input type="checkbox"/> Bending	50	<input type="checkbox"/> Light Propagation	6	<input type="checkbox"/> Reflectivity	3
<input type="checkbox"/> Optical Fibre Couplers	44	<input type="checkbox"/> Optical Fibre Filters	6	<input type="checkbox"/> Sapphire	3
<input type="checkbox"/> Optical Fibre Testing	39	<input type="checkbox"/> Rayleigh Scattering	6	<input type="checkbox"/> Schrodinger Equation	3
<input type="checkbox"/> Optical Fibres	36	<input type="checkbox"/> Reviews	6	<input type="checkbox"/> Silver	3
<input type="checkbox"/> Silicon Compounds	36	<input type="checkbox"/> Thermo Optical Effects	6	<input type="checkbox"/> Spectral Line Narrowing	3

取消 排除 精炼



消除90%的检索“噪音”

120  
(8.7%)

120 条来自 Inspec®的结果:

Q "Hollow Core Fiber" (主题) and 2016-2026 (出版年)

精炼依据: 分类: Optical Propagation Dispersion And Attenuation In Fibres X 受控词表: Optical Fibre Cladding or Refractive Index X 全部清除

\*检索数据截止于2026年4月

# 叙词表精炼检索案例：以"机器学习在无人机飞行路径规划中的应用"为例

Quick search  for

26,349



**Classification code**

Filter results:

<input type="checkbox"/> Mobile robots	14,799	<input type="checkbox"/> Other topics in solid Earth physics	759
<input type="checkbox"/> Aerospace control	10,500	<input type="checkbox"/> Data handling techniques	746
<input type="checkbox"/> Computer vision and image processing techniques	8,543	<input type="checkbox"/> Radio links and equipment	735
<input type="checkbox"/> Optical, image and video signal processing	6,276	<input type="checkbox"/> Control system analysis and synthesis methods	702
<input type="checkbox"/> Telerobotics	6,209	<input type="checkbox"/> Signal processing and detection	666
<input type="checkbox"/> Spatial variables control	3,774	<input type="checkbox"/> Protocols	664
<input checked="" type="checkbox"/> Neural nets	3,679	<input type="checkbox"/> Radionavigation and direction finding	662
<input type="checkbox"/> Control engineering computing	2,737	<input type="checkbox"/> Aerospace industry	662
<input type="checkbox"/> Optimisation techniques	2,732	<input type="checkbox"/> Fluid mechanics and aerodynamics	643
<input type="checkbox"/> Instrumentation and techniques for geophysical, hydrospheric and lower atmosphere research	2,564	<input type="checkbox"/> Knowledge engineering techniques	631
<input type="checkbox"/> Image recognition	2,486	<input type="checkbox"/> Traffic engineering computing	617
<input type="checkbox"/> Mobile radio systems	2,432	<input type="checkbox"/> Graphics techniques	615
<input type="checkbox"/> Data security	1,823	<input checked="" type="checkbox"/> Reinforcement learning	603
<input type="checkbox"/> Optimisation techniques	1,678	<input type="checkbox"/> Stability in control theory	583
<input type="checkbox"/> Computer communications	1,463	<input type="checkbox"/> Geography and cartography computing	560
<input type="checkbox"/> Agriculture	1,454	<input type="checkbox"/> Inspection and quality control	541
<input type="checkbox"/> Geophysical techniques and equipment	1,300	<input type="checkbox"/> Biology and medical computing	538
		<input type="checkbox"/> Internet software	517
		<input type="checkbox"/> Optical radar	506

View: 10 60 Max



**Controlled vocabulary**

Filter results:

<input type="checkbox"/> Geophysical Image Processing	537	<input type="checkbox"/> Diseases	126
<input type="checkbox"/> Reinforcement Learning	534	<input type="checkbox"/> Image Capture	126
<input type="checkbox"/> Control Engineering Computing	511	<input type="checkbox"/> Helicopters	121
<input type="checkbox"/> Robot Vision	433	<input type="checkbox"/> Aerospace Computing	119
<input type="checkbox"/> Neural Nets	416	<input type="checkbox"/> Infrared Imaging	119
<input type="checkbox"/> Image Segmentation	389	<input type="checkbox"/> Power Engineering Computing	115
<input type="checkbox"/> Computer Vision	385	<input type="checkbox"/> Multi-Robot Systems	112
<input type="checkbox"/> Cameras	288	<input type="checkbox"/> Disasters	111
<input type="checkbox"/> Agriculture	278	<input type="checkbox"/> Edge Computing	108
<input type="checkbox"/> Image Resolution	267	<input type="checkbox"/> Data Augmentation	96
<input type="checkbox"/> Remote Sensing	250	<input type="checkbox"/> Support Vector Machines	94
<input type="checkbox"/> Crops	239	<input type="checkbox"/> Supervised Learning	89
<input type="checkbox"/> Optimisation	230	<input type="checkbox"/> Emergency Management	87
<input type="checkbox"/> Recurrent Neural Nets	223	<input type="checkbox"/> Gradient Methods	87
<input type="checkbox"/> Inspection	218	<input type="checkbox"/> Object Recognition	84
<input type="checkbox"/> Image Colour Analysis	205	<input type="checkbox"/> Condition Monitoring	82
<input checked="" type="checkbox"/> Path Planning	201	<input type="checkbox"/> Image Motion Analysis	77
<input type="checkbox"/> Video Signal Processing	180	<input type="checkbox"/> Computer Network Security	73
<input type="checkbox"/> Collision Avoidance	172	<input type="checkbox"/> Image Sensors	73
<input type="checkbox"/> Pattern Classification	171	<input type="checkbox"/> Target Tracking	73
		<input type="checkbox"/> Video Surveillance	73

View: 10 60 Max

201

Expert search

\*检索结果截止于2026年4月，数据来源于EV平台Inspec数据库

# 如何应对涉及物理量参数/材料系统的文献检索?

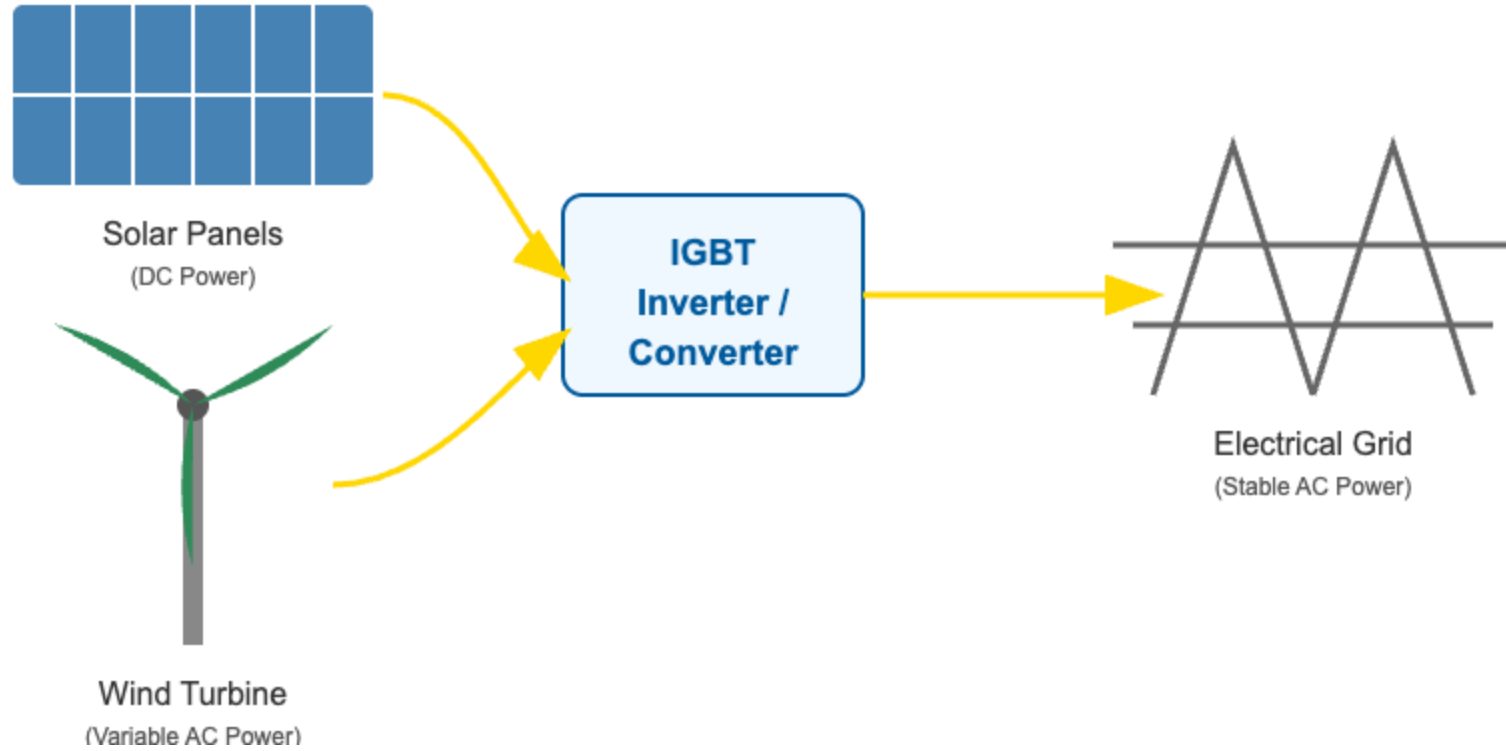
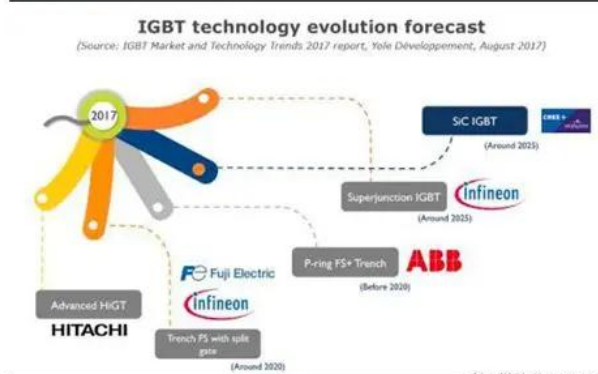


图 7: 不同电压级别 IGBT 的应用场景



数据来源: 电子工程专辑, 东吴证券研究所

图 38: IGBT 的结构设计趋势



数据来源: Yole, 东吴证券研究所

\*图片来源于网络

# Inspec底层数据深度加工—数值索引

- 数值检索字段包含文献中涉及物理量参数。可使用科学计数法（如2.65E+10Hz）和普通计数法(如26500000000Hz)进行数值输入，较大数值建议使用科学计数法，以保证准确。每一个数值索引字段格式包含：

物理量	数值	单位
-----	----	----
- 检索设置规则：
  - ❖ 如果在左侧检索框中输入一个数值，而右侧空缺，表示检索范围为大于或等于左侧输入数值。
  - ❖ 如果在右侧检索框中输入一个数值，而左侧空缺，表示检索范围为小于或等于右侧输入数值。
  - ❖ 如果在左侧和右侧输入相等的数值，表示检索范围为等于输入数值。
  - ❖ 如果两侧输入不同的数据，则表示搜索范围在两者之间。

Inspec – 数值索引包含的物理量及单位		
• 年龄 (年)	• 电子伏特能量 (电子伏特)	• 辐射吸收剂量 (戈雷)
• 海拔 (米)	• 能量 (焦耳)	• 辐射剂量当量 (西弗)
• 视在功率 (伏安)	• 频率 (赫兹)	• 辐射暴露 (库仑每公斤)
• 带宽 (赫兹)	• 增益 (分贝)	• 放射性 (贝克勒尔)
• 比特率 (每秒字节数)	• 银河距离 (秒差距)	• 无功功率 (乏)
• 字节率 (每秒字节数)	• 地心距离 (米)	• 电阻 (欧姆)
• 电容 (法拉)	• 日心距离 (天文单位)	• 尺寸 (米)
• 计算机执行率 (每秒指令数)	• 损失 (分贝)	• 恒星质量 (太阳质量)
• 计算机速度 (每秒浮点运算次数)	• 磁通密度 (特斯拉)	• 存储容量 (字节)
• 电导 (西门子)	• 质量 (公斤)	• 温度 (开尔文)
• 电流 (安培)	• 内存大小 (字节)	• 时间 (秒)
• 深度 (米)	• 噪声系数 (分贝)	• 速度 (米每秒)
• 距离 (米)	• 图片尺寸 (图片元素)	• 电压 (伏特)
• 效率 (百分比)	• 功率 (瓦特)	• 波长 (米)
• 电导率 (西门子每米)	• 压力 (帕斯卡)	• 字长 (字节)
• 电阻率 (欧姆·米)	• 打印机速度 (每秒字符数)	

# Inspec底层数据深度加工—化学索引

分析方法—化学索引介绍：Inspec数据库将文献中讨论的物质和材料系统的信息进行标引。总体可分为两种角色类型：基本角色和功能角色。基本角色是对物质涉及化学信息的基本描述，即物质本身是由几种元素组成。功能角色是对物质涉及的材料工艺进行描述，即物质之间的相互关系，如掺杂、基质等。

## 物质角色说明

基本角色	缩写	例子	功能角色 (特殊工艺角色)	缩写	例子
Element (单元素)	EL	Na/el	Adsorbate (吸附物)	ADS	CO/ads
Binary System (双元素)	BIN	GaN/bin	Dopant (掺杂物)	DOP	P/dop
System of >2 components (多于2个元素)	SS	H2SO4/ss	Interface System (界面系统)	INT	Si/int
			Surface/Substrate (表面/基质)	SUR	Fe/sur

# Inspec数值索引精炼检索结果案例

20,198 条来自 Inspec®的结果:

Q IGBT or "insulated gate bipolar transistors" (主题)

检索

大小 (米)  
恒星质量 (Msol)  
存储容量 (Bit)  
温度 (K)  
时间 (秒)  
速度 (m/s)  
电压 (V)  
波长 (米)  
单词长度 (Bit)

电压 (V)

您可以指定最小值 (左侧字段)、最大值 (右侧字段) 或范围 (两个字段)。  
可以按照 1.0E+02 或 0.005 的格式输入值。

示例:

2.0E+04 to 2.5E+04  
5.1E+06 to 7.9E+06

20,198 条来自  
Inspec®的结果

1,326 条来自  
Inspec®的结果

1,326 条来自 Inspec®的结果:

Q IGBT or "insulated gate bipolar transistors" (主题) and 1200 2300 (电压 (V))

\*基于Web of Science平台,  
检索结果截止于2026年4月

# Inspec化学索引精炼检索结果案例

20,198 条来自 Inspec®的结果:

Q IGBT or "insulated gate bipolar transistors" (主题)

检索

天文学对象

作者标识符

所有化学特征描述

学科分类代码

受控与非受控词表

受控词表

文献类型

编者

记录标识符

所有化学特征描述

"化学特征描述" 字段包含涉及来源出版物文献中讨论的重要物质和材料系统的受控数据。未涵盖有机物质。

示例:

Ni/el

Rh/el

C/bin

Cu2O/bin



2,000 条来自 Inspec®的结果:

Q IGBT or "insulated gate bipolar transistors" (主题) and SiC/bin (所有化学特征描述)

20,198 条来自  
Inspec®的结果

2,000 条来自  
Inspec®的结果

\*基于Web of Science平台,  
检索结果截止于2026年4月

# 检索演示：如何使用Inspec数值索引在Engineering Village平台进行精准检索

Quick search All fields for "Insulated Gate Bipolar Transistor\*" or IGBT

20,239

排除了98.9%的检索噪音（不相关记录）。

1,012

Expert search (((("Insulated Gate Bipolar Transistor\*" or IGBT) WN ALL)) AND (((NU\_VOLTAGE GTE 1700 V) AND (NU\_VOLTAGE LTE 3300 V))))

Refine

By physical property

Filter results by physical properties such as size, temperature, pressure and [many more](#).

Voltage

There are 3,849 total results for Voltage

between 1700 3300

Voltage (V) Refine

\*数据截止于2026年4月，Inspec数据库，Engineering Village平台

# Inspec底层数据深度加工—文档处理类型

处理类型	解释
Applications (a) /应用型	源文件中描述仪器、设备等的使用，涉及应用场景
Bibliography or Literature Survey (b) 书目或文献调查	参考文献超过50种的文章
Economic Aspects or Market Survey (e) 经济因素或市场调查	源文件涉及经济或商业方面，如成本、定价、市场预测等
General or Review Article (g) 综述文章	对某领域发展的的总回顾和总结，包含方法、最前沿的评论、概述等。对于想要对不熟悉主题领域进行研究的科研人员很有价值
New Developments (n) 新进展	专利意义上的任何新的或新颖的内容，或者可能产生某些专利的文章（查看文献时注意出版时间）
Practical Aspects (p)/实践型	实际使用和手工操作相关
Product Review (r) 产品评述	上述实践型的子集，包括产品规格和使用指南等
Theoretical Aspects or Mathematical Treatment (t)/理论型或数学解析	理论和数学分析方法，分析事实及其相互关系
Experimental Aspects (x)/试验型	涉及测试、试验、试程序或政策的内容

# 使用Inspec文档处理类型对检索结果按照研究方法进行分类



Engineering Village

Search

Search history

Alerts

Selected record

Expert search

```
((((("autonomous aerial vehicle*" OR drone* OR "UAV*" OR "unmanned aerial vehicle*") WN ALL)) AND ({c6264} OR {c6263}) WN CL)) AND ({path planning} WN CV))
```



Reset form

Databases

Date

Sort by

Autostemming

Search codes

Author

Document type

Source title

Author affiliation

IPC Code

Treatment

Selected index: Treatment type

Select terms below to add to search

Connect terms with:  AND  OR

- APP - Applications (Inspec)
- BIB - Bibliography (Inspec)
- ECO - Economic (Inspec)
- EXP - Experimental (Inspec)
- GEN - General review (Inspec)
- NEW - New development (Inspec)
- PRA - Practical (Inspec)
- PRO - Product review (Inspec)
- THR - Theoretical (Inspec)

201 records found in Inspec for 1896-2025: ((("autonomous aerial vehicle\*" OR drone\* OR "UAV\*" OR "unmanned aerial vehicle\*") WN ALL)) AND ({c6264} OR {c6263}) WN CL AND ({path planning} WN CV)

Create alert

Save search

Share search

RSS feed

Refine

By physical property

Filter results by physical properties such as size, temperature, pressure and [many more](#).

Preprint articles are in



Discipline

Publisher

{c6264} OR {c6263}) WN CL

Sort by:

type. [Learn more](#)

# Inspec底层数据深度加工—文档处理类型

1,694 条来自 Inspec®的结果:

Q "Hollow core fiber" (主题) [复制检索式链接](#)

主题 "Hollow core fiber"

AND  处理类型

+ 添加行 + 添加日期范围

- 高被引论文 3
- 热点论文 1
- 开放获取 388

出版年

- 2026 33
- 2025 254

Application

Bibliography

Economic

General or Review

New Development

Practical

2 Terahertz waveguiding through 3D-Printed Bar-Nested Hollow-Core optical fibers 45 参考文献

Siddiqui, M.Z.; Chiba, K.; (...); Ordu, M.

May 2026 | Optical Fiber Technology: Materials, Devices and Systems 7, 60-75 104730



50 条来自 Inspec®的结果:

Q "Hollow core fiber" (主题) and New Development (处理类型)

\*基于Web of Science平台，  
检索结果截止于2026年4月

# 3. Inspec API介绍

## Inspec API 核心价值主张

*Data that can deliver impact*

### 50+年权威数据

半个世纪专业策展  
学科专家知识积淀

### 自动化与高精度

消除手动采集  
降低人为错误

精准洞察  
驱动创新

### 精细化分类体系

独有Taxonomy分类  
过滤80-90%噪音

### 灵活定制与集成

多种API端点  
低技术门槛嵌入

"将50年精心策展的科研数据无缝融入您的决策流程，以精准洞察驱动创新战略"

# 六大核心应用场景

从数据到决策 — 让科研数据创造真正业务价值

01

研发趋势分析

实时追踪研究动态  
保持行业领先

02

研究产出评估

定位顶尖成果  
支撑资源配置

Inspec  
API

06

元数据定制

灵活组合检索  
个性化数据获取

05

workflow 集成

减少手动处理  
加速洞察交付

03

R&D 战略规划

识别技术空白  
优化研发布局

04

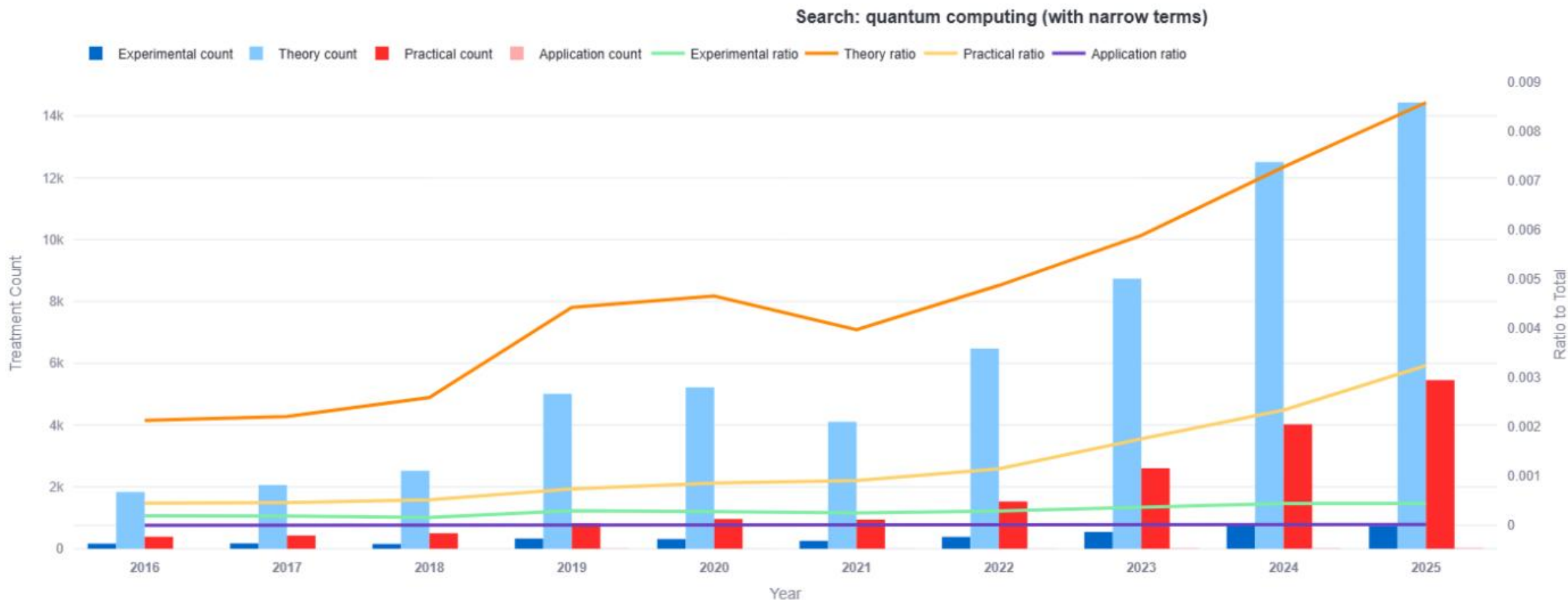
专家网络构建

开发者友好支持  
助力合作拓展

- ✓ 完善文档体系与技术支持
- ✓ 稳健架构保障稳定性能
- ✓ 化学/数值/天文索引及专利代码增强互操作性

# Inspec API使用案例（分析“量子计算”的研究）

Inspec 处理代码(Treatment code) 表明了来源文献作者针对某一主题所采用的研究方法或处理方式。



分析结论：“量子计算”领域仍有大量的理论研究，然而实践性研究正变得愈发普遍，但实验性或应用性研究尚未出现增长迹象。

## 4. 平台赋能，更多实用检索功能介绍

- **Inspec Analytics**—检索到分析的丝滑切换，全方位洞察研究主题（无缝集成在 **Web of Science** 和 **Engineering Village**平台）
- **Engineering Village**平台，轻松使用国际专利分类号（**IPC**）进行非专利文献检索

# Inspec数据库功能更新—Inspec Analytics

## Inspec Analytics Integration

Sites who subscribe to Inspec on the Web of Science platform can now take advantage of direct integration from **Subject Classification Codes** and **Controlled Terms** to the Inspec Analytics platform provided by IET. Inspec Analytics is designed to help research professionals explore global trends in physics, engineering and technology research with visualizations of publication, funding, co-occurring concept trends for articles indexed in Inspec. No additional subscription is required for the basic view of Inspec Analytics. Inspec Analytics will also support inbound links so the Web of Science so that users can explore items directly in Inspec on the Web of Science platform.

The screenshot displays the integration of Inspec Analytics into the Web of Science platform. It shows three main sections: Subject Classification codes, Controlled Terms, and Uncontrolled Terms. A 'View in Inspec Analytics' button is highlighted with a red box, and a search bar is also visible. Below the text, a screenshot of the Inspec Analytics interface is shown, displaying a line graph for '88520 - Transportation' and a table of articles published between 2013 and 2022.

Year	Articles Published
2013	86,516
2014	~90,000
2015	~95,000
2016	~100,000
2017	~105,000
2018	~110,000
2019	~115,000
2020	~120,000
2021	~125,000
2022	631,372

## 要点:

在 Web of Science 平台上订阅 Inspec 的站点现在可以利用从**主题分类代码**和**受控检索词**到 IET 提供的 Inspec Analytics 平台的直接集成。Inspec Analytics 旨在

1. 帮助研究专业人员探索物理学、工程和技术研究的全球趋势
2. 可视化 Inspec 中索引的文章的出版、资金、共生概念趋势。

Inspec Analytics 的基本视图不需要额外订阅。Inspec Analytics 还将支持入站链接，以便 Web of Science 用户可以直接在 Web of Science 平台上的 Inspec 中浏览项目。

# Inspec在Web of Science平台新增功能模块 – Inspec Analytics

## WoS平台无缝集成Inspec Analytics/Plus

用Inspec Analytics 为您的研究输出导航方向

Semantic  
technology  
+  
Inspec's index  
=  
Inspec  
knowledge  
graph



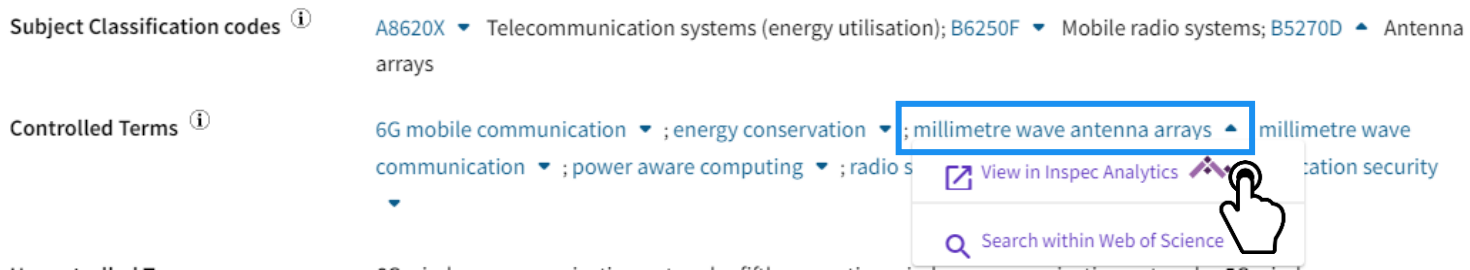
**Inspec Analytics**

### Identify the next hot topic

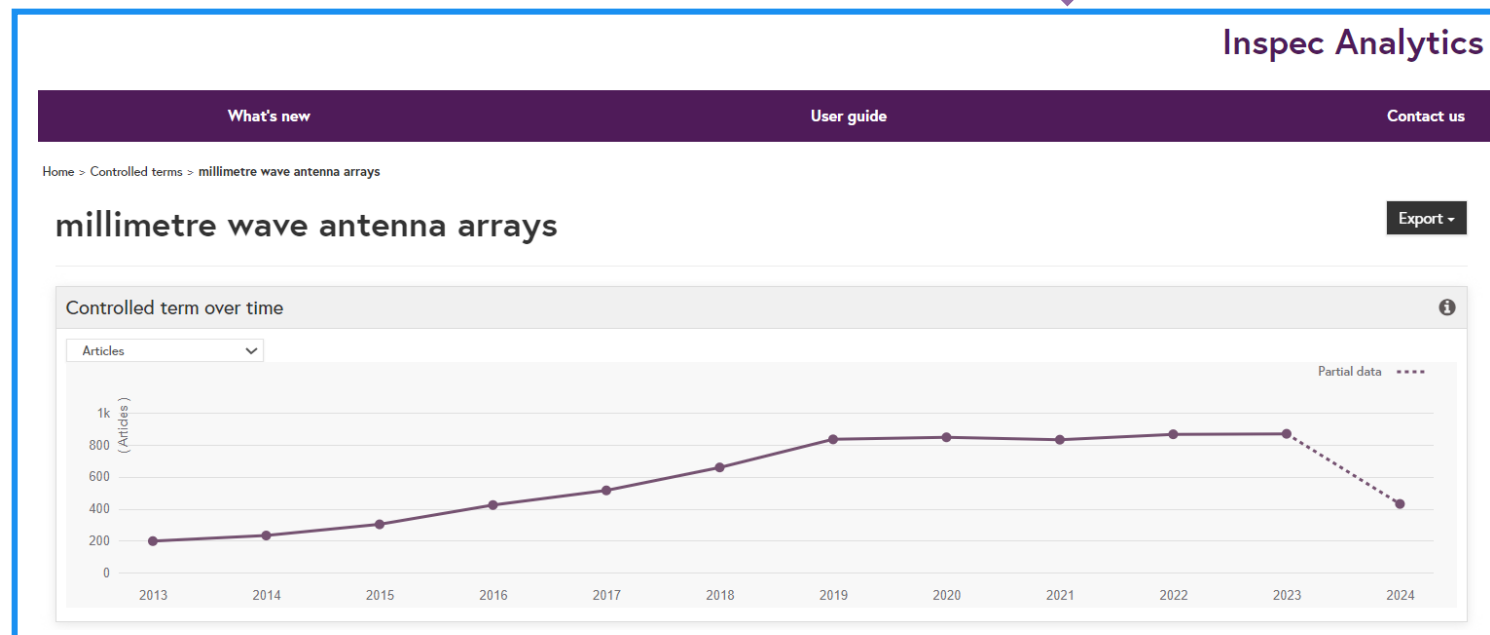
- Unlock trends and patterns in the literature
- Analyze research at the global and local levels
- Monitor the impact of thousands of organizations and scientific concepts

# Inspec用户可以直接在WoS上点击标引字段进入Inspec Analytics获取科研洞察

1 在Inspec数据库中定位相关论文



2 访问Inspec Analytics的直接链接以进行更深入的分析





3 在Inspec Analytics中跟踪更广泛的科研发文趋势

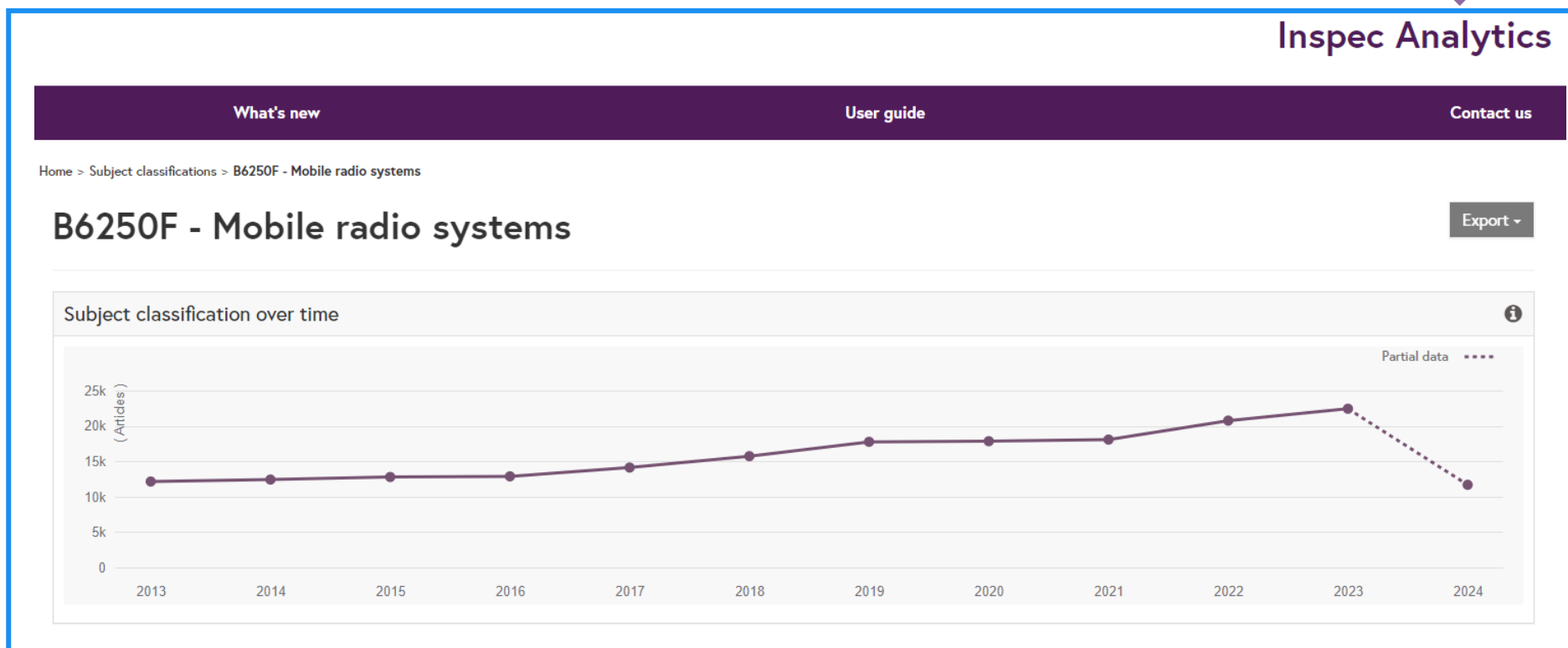


# Inspec用户可以直接在WoS上点击标引字段进入Inspec Analytics获取科研洞察

Subject Classification codes ⓘ A8620X ▾ Telecommunication systems (energy utilisation); B6250F ▲ Mobile radio systems; B5270D ▾ Antenna arrays

Controlled Terms ⓘ 6G mobile communication ▾ ; energy conservation ▲ ; millimeter wave communication ▾ ; power aware computing ▾ ; radio spectrum management ▾ ; telecommunication security ▾

View in Inspec Analytics 

Search within Web of Science 



# Inspec Analytics集成到WoS平台后，Inspec的记录结果页面

International Patent Classification: G02F2/02 "Frequency-changing of light, e.g. by quantum counters"; G02F1/37 for second-harmonic generation

Subject Classification codes ①: A4280W Ultrafast optical techniques; A3150 Excited states of atoms and molecules; A3280D Atomic autoionization; A3280F Atomic photoionization, photodetachment, photoelectron spectra; A4265K Optical harmonic generation, frequency conversion, parametric oscillation and amplification

CODEN: PNASAG

Controlled Terms ①: atom-photon collisions; autoionisation; dark states; high-speed optical techniques; optical harmonic generation; spectral line breadth

Uncontrolled Terms: 2 dark state; attosecond extreme-ultraviolet pulse; attosecond p... ectra; attoseconds timescale; controlling laser-dressed resonance line shape; Cooper minimum; Fano resonance; gas medium; gas target; high-harmonic generation; narrow resonances; p autoionizing state; p Fano line shape; predicted ATA spectral line shape; rapid phase variation; sharp spectral features; spectral filtering; spectral minimum; strongly shaped attosecond XUV; strongly shaped XUV pulse; time 2.0 s; time delay; time domain; time-delayed infrared laser

Language: English

Accession Number: INSPEC:24621353

PubMed ID: 38170749

ISSN: 1523-1081

Treatment: 1523-1081

Numeric: 1523-1081

[View in Inspec Analytics](#)

[Search within Web of Science](#)

Inspec Analytics

high-speed optical techniques

Controlled term over time

Articles published: 34,348 articles published with this Controlled term between 2013 - 2024

Articles published % change: 2013 - 2023 article output increased 41.58%

Times cited: 206,616 times, with an average of 6.02 citations per article

Co-occurring concepts

Controlled terms	Count
1. laser materials processing	3654
2. optical pumping	3554
3. laser beams	3004
4. laser beam effects	2946
5. time resolved spectra	2808
6. optical harmonic generation	2491
7. laser ablation	2374
Total terms: 4476	

Subject classifications	Count
1. A4000 - Fundamental areas of phenomenology	25067
2. A4200 - Optics	24498
3. A4280 - Optical elements, devices and systems	18764
4. A4280W - Ultrafast optical techniques	18700
5. B4000 - Optical materials and applications, electro-optics and optoelectronics	18702
6. B4300 - Lasers and masers	16998
7. A7000 - Condensed matter: electronic structures, electrical, magnetic, and optical properties	13470
Total classifications: 2973	

Web of Science

Search

37,678 results from Inspec® for:

high-speed optical techniques (Controlled Terms) and 2013-2024 (Year Published)

37,678 Documents

Refine results

Filter by Marked List

Quick Filters

Publication Years

1 2024 3,170

2 2023 4,385

3 2022 4,684

4 2021 8,231

5 2020 3,475

1 An exciting era for ultrafast science in France

2024 | Europhysics News 55 (1), pp.9-9

Progress across five scientific topics currently being investigated by the French scientific network on ultrafast phenomena highlight both a rapid pace of discovery and emerging new directions of research.

0 References

2 Temporal focusing based ultrafast high-resolution spectroscopy

Chi Zhang and Xinliang Zhang

Real-time Photonic Measurements, Data Management, and Processing VI

2021 | Proceedings of SPIE 11902, pp.1190202 (9 pp.)

32 References

\*在Inspec Analytics平台点击“show articles”，返回WoS检索Inspec数据库的文献

# “引文网络” — 锁定研究主题 “核心文献” 的参考文献和施引文献

出版商处的免费全文 全文链接 导出 添加到标记结果列表 1 / 120

## Attenuation limit of silica-based hollow-core fiber at mid-IR wavelengths

**作者** Fei Yu; Peng Song; Dakun Wu; Birks, T.; Bird, D.; Knight, J.  
[查看 Web of Science ResearcherID 和 ORCID](#) (由 Clarivate 提供)

**来源出版物** APL Photonics  
[← 查看期刊影响](#)  
卷: 4 期: 8 页: 080803 (6 pp.)  
DOI: 10.1063/1.5115328

**出版时间** Aug. 2019

**已索引** 2019-10-14

**文献类型** Journal Paper

**摘要** We study the mid-infrared attenuation of antiresonant hollow-core fiber made of fused silica glass. The role of absorptive losses increases with wavelength but can be minimized by reducing the overlap of the trapped light with the silica. We show that this overlap is least at the lowest-order antiresonance condition, corresponding to the thinnest core wall, and for higher resonances scales with the core wall thickness. A record-low minimum attenuation of 18 dB/km measured in our fiber at 3.1 μm wavelength is not limited by silica absorption. We measured 40 dB/km attenuation at 4 μm wavelength, where the attenuation of bulk silica is 860 dB/m. We show that this corresponds to a modal overlap of  $2.81 \times 10^{-5}$  which is in good agreement with simulations, suggesting that at this wavelength, attenuation is limited by silica absorption. This enables us to predict the achievable attenuation at longer wavelengths as well. Extrinsic losses due to gaseous molecular absorption may make demonstration of such losses difficult in some spectral bands. In contrast to shorter wavelengths, where leakage loss is the primary attenuation mechanism, introducing additional elements into the cladding design is unlikely to reduce the attenuation further, and further loss reduction would require a larger core size.

### 引文网络

来自 Web of Science 核心合集

**79**  
被引频次

[创建引文跟踪](#)

**95**  
被引频次 所有数据库

— 查看较少的被引频次

**79** 来自 Web of Science 核心合集  
0 来自 Arabic Citation Index  
0 来自 BIOSIS Citation Index  
**12** 来自 中国科学引文数据库™  
0 来自 Data Citation Index  
0 来自 Russian Science Citation Index ①  
0 来自 SciELO Citation Index  
1 来自 Derwent Innovations Index  
**4** 来自 ProQuest™ Dissertations & Theses Citation Index  
0 来自 政策引文索引  
**5** 来自 Research Commons

+ 查看施引预印本

**34**  
篇引用的参考文献

→ 查看相关记录

# Inspec数据库功能更新—索引字段全景视图

文献 研究人员

选择数据库: **所有数据库** 合集: All

包括Inspec数据库

字段检索 检索式生成器 被引参考文献

主题 示例: oil spill\* mediterranean

+ 添加行 + 添加日期范围

清除 检索

在WoS平台，使用Inspec数据库，Inspec专家底层索引字段在ALL Databases（所有数据库）或Core Collection库（核心合集）中检索也为用户全景呈现

检索 > “Artificial Intelligence” (主题) > “Artificial Intelligence” (主题) AND 2016-2026 (出版年) 的结果

**1,689,971** 条来自 Web of Science 核心合集, 中国科学引文数据库<sup>SM</sup>, Inspec<sup>®</sup>, KCI-Korean Journal Database, MEDLINE<sup>®</sup>, ProQuest<sup>™</sup> Dissertations & Theses Citation Index, SciELO Citation Index的结果:

“Artificial Intelligence” (主题) and 2016-2026 (出版年)

复制检索式链接

## 数据库

<input type="checkbox"/> Inspec <sup>®</sup>	1,430,828
<input type="checkbox"/> Web of Science 核心合集	866,560
<input type="checkbox"/> MEDLINE <sup>®</sup>	196,306
<input type="checkbox"/> Research Commons	70,938
<input type="checkbox"/> ProQuest <sup>™</sup> Dissertations & Thes...	50,898

全部查看 >

国际专利分类 来自 Inspec®

查看记录

Inspec®

国际专利分类

G06T "Image data processing or generation, in general"; G06F40/00 Handling natural language data; G06N3/02 using neural network models; G06N20/00 Machine learning

IPC代码被Inspec人工专家标引，为用户提供潜在专利领域信息。

学科分类代码 来自 Inspec®

查看记录

Inspec®

学科分类代码

C6180N Natural language interfaces; C5260B Computer vision and image processing techniques; C6264 Neural nets; C7820N Natural language processing

点击相关的Inspec学科分类代码，检索最相关学科内的文献记录。

CODEN 来自 Inspec®

查看记录

Inspec®

CODEN

ACSUEY

受控词表 来自 Inspec®

查看记录

Inspec®

受控词表

computer vision data models ; deep learning (artificial intelligence) ; maximum likelihood estimation ; natural language processing ; reviews

点击相关的标准受控关键词在Inspec数据库查询相关记录。

非受控词表 来自 Inspec®

查看记录

Inspec®

非受控词表

deep generative models; diffusion models; temporal data modeling

点击进入Inspec数据库查询该记录

### Web of Science 中的使用情况

189

最近 180 天

[进一步了解](#)

780

2013 年至今

### 此记录来自:

#### Web of Science 核心合集

- Science Citation Index Expanded (SCI-Expanded)
- Science Citation Index Expanded (SCI-Expanded)

#### 在其他数据库中查看记录:

- [查看工程数据 \(位于 Inspec® 中\)](#)
- [查看工程数据 \(位于 Inspec® 中\)](#)

### 建议修正

如果您要改进此记录中的数据质量，请 [建议修正](#)



# 独特洞察力提升研究成果

用Inspec Analytics跟踪您的领域中的新趋势和新热点



What are the growing topics in my field?



Which subjects should I include in my literature search?



Where can I find collaborators?



What journals and conferences are most relevant?



How could my work contribute to my institution's output?

# Inspec Analytics Plus介绍

## 揭示对全球研究影响的更深层次的洞悉

Inspec Analytics Plus为Inspec Analytics增加了有价值的新数据集和功能，提供了完整的引用度量和加强对数千个组织和科学概念的协作分析。



### 引文指标

加深你对全球科学趋势的理解。引用指标数以千计的科学概念让你比较和对比新兴全球研究趋势的影响。

### 资助来源

集中你的努力来加速你的资金搜索。评估在你所选择的学科中，哪些组织资助了最多的研究，以及随着时间的推移，这些资助在哪些方面有所增加。

### 被高度引用的主题和组织

将研究项目的范围定义为最大化你的影响力。  
将项目规划为使他们对研究的贡献最大化。  
社区通过探索高引用主题，合作者和出版机会。

### 组织科研绩效

评估你的组织的影响。深入了解组织的绩效。  
在特定的研究领域内，以全球景观为基准。

### 协作分析

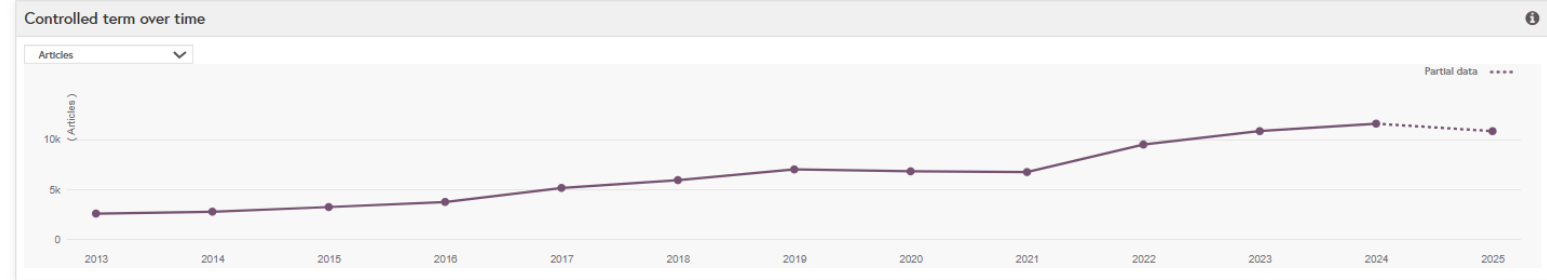
评估合作伙伴关系和知识转让举措的成功情况。监测和比较  
为非政府组织建立合作伙伴关系和项目  
25,000个组织。

# Inspec Analytics — 一键获取主题的文獻情报

- Organisations
- Controlled terms >
- photovoltaic power systems >
- Organisations
- Co-occurring controlled terms
- Co-occurring subject classifications
- Journals
- Conferences
- Broader controlled terms
- Narrower controlled terms
- Related controlled terms
- Funding bodies
- Subject classifications

## photovoltaic power systems

Export -



## Articles

### Articles published

86,722

articles published with this Controlled term between 2013 - 2025

Show articles

### Articles published % change

Between

2013 - 2024

article output increased

347.24% ▲

### Times cited

Articles published with this Controlled term between 2013 - 2025 have been cited

646,493

times, with an average of

7.45

citations per article

## Co-occurring concepts



- Controlled terms i
- Subject classifications i

## Co-occurring concepts

Controlled terms <span style="float: right; font-size: 10px;">i</span>	
1. power grids	30322
2. power generation control	18520
3. distributed power generation	16011
4. power engineering computing	14090
5. power generation economics	14022
6. maximum power point trackers	13833
7. invertors	12071
Total terms : 4273	

Subject classifications <span style="float: right; font-size: 10px;">i</span>	
1. B8000 - Power systems and applications	86017
2. B8200 - Generating stations and plants	84720
3. B8250 - Solar power stations and photovoltaic power systems	84360
4. B8100 - Power networks and systems	48486
5. B8110 - Power systems	38972
6. B0000 - General topics, engineering mathematics and materials science	31357
7. B8300 - Power apparatus and electric machines	30746
Total classifications : 1613	

# Inspec Analytics — 一键获取主题的文獻情报

IET sites ↓

- Organisations
- Controlled terms >
- photovoltaic power systems >
- Organisations
- Co-occurring controlled terms
- Co-occurring subject classifications
- Journals
- Conferences
- Broader controlled terms
- Narrower controlled terms
- Related controlled terms
- Funding bodies
- Subject classifications

## Top organisations

Organisations		
1. <a href="#">State Grid Corporation of China</a> Beijing, China corporate	3462	<div style="width: 100%;"></div>
2. <a href="#">North China Electric Power University</a> Beijing, China academic	1645	<div style="width: 50%;"></div>
3. <a href="#">Indian Institute of Technology Delhi</a> New Delhi, India academic	1552	<div style="width: 45%;"></div>
Total organisations : 7664		

## Journals

Journal		
1. Energies	3223	<div style="width: 100%;"></div>
2. Renewable Energy	1557	<div style="width: 50%;"></div>
3. Solar Energy	1477	<div style="width: 48%;"></div>
4. Energy	1331	<div style="width: 42%;"></div>
5. IEEE Access	1317	<div style="width: 41%;"></div>
6. Applied Energy	1256	<div style="width: 39%;"></div>
7. Energy Conversion and Management	1030	<div style="width: 32%;"></div>
Total journals : 1576		

## Conferences

Conference		
1. 2017 IEEE 44th Photovoltaic Specialist Conference (PVSC)	232	<div style="width: 100%;"></div>
2. 28th European Photovoltaic Solar Energy Conference and Exhibition (EU PVSEC 2013). Proceedings	152	<div style="width: 65%;"></div>
3. 33rd European Photovoltaic Solar Energy Conference and Exhibition. Proceedings of the International Conference	150	<div style="width: 63%;"></div>
4. 2025 IEEE 53rd Photovoltaic Specialists Conference (PVSC)	148	<div style="width: 62%;"></div>
5. 2024 IEEE 52nd Photovoltaic Specialist Conference (PVSC)	146	<div style="width: 61%;"></div>
6. 2020 47th IEEE Photovoltaic Specialists Conference (PVSC)	143	<div style="width: 59%;"></div>
Total conferences : 7287		

## Related controlled terms

Broader terms		
1. power systems	1503	<div style="width: 100%;"></div>

Narrower terms		
1. solar panels (photovoltaic)	6652	<div style="width: 100%;"></div>

Related terms		
1. solar cells	95757	<div style="width: 100%;"></div>
2. renewable energy sources	78866	<div style="width: 82%;"></div>
3. solar power stations	25772	<div style="width: 27%;"></div>
4. solar power	25603	<div style="width: 26%;"></div>
5. maximum power point trackers	18871	<div style="width: 20%;"></div>
6. hybrid power systems	15436	<div style="width: 16%;"></div>
7. solar cell arrays	14067	<div style="width: 15%;"></div>
Total terms : 9		

## Top funders

Funders		
1. National Natural Science Foundation of China People's Republic of China	2049	<div style="width: 100%;"></div>
2. U.S. Department of Energy United States	473	<div style="width: 23%;"></div>
3. National Science Foundation United States	310	<div style="width: 15%;"></div>
4. National Key Research and Development Program of China People's Republic of China	295	<div style="width: 14%;"></div>
5. State Grid Corporation of China	253	<div style="width: 12%;"></div>
Total funders : 1794		



# 基于专利的说明书/权利要求，对术语进行受控词汇的细化

Engineering Village Search history Alerts Selected records More

Quick search All fields for Drones or UAV or "unmanned aerial vehicles" or "autonomous ae" [Search]

Turn off AutoSuggest | + Add search field | Reset form

Databases Date Language Document type Sort by Browse indexes Autostemming Discipline Treatment

All  Compendex  Inspec  Patents Plus [Search]

233,873 records found in Patents Plus for 1790-2026: (((Drones or UAV or "unmanned aerial vehicles" or "autonomous aerial vehicles") WN ALL)

Controlled vocabulary Filter results: Start typing to filter results

<input type="checkbox"/> Fuselages	10,537	<input type="checkbox"/> Lift	3,306
<input type="checkbox"/> Mobile Antennas	10,431	<input type="checkbox"/> Rope	3,306
<input type="checkbox"/> Traction Motors	10,190	<input type="checkbox"/> Three Dimensional Computer Graphics	3,287
<input type="checkbox"/> Controllers	9,915	<input type="checkbox"/> Aircraft Seats	3,254
<input type="checkbox"/> Electric Machine Control	9,744	<input type="checkbox"/> Intelligent Vehicle Highway Systems	3,228
<input type="checkbox"/> Rotating Machinery	9,449	<input type="checkbox"/> Mobile Telecommunication Systems	3,218
<input type="checkbox"/> Aerodynamics	8,877	<input type="checkbox"/> Automobile Frames	3,198
<input type="checkbox"/> Electric Power Transmission	8,843	<input type="checkbox"/> Gears	3,160
<input type="checkbox"/> Location	8,823	<input type="checkbox"/> Damping	3,144
<input type="checkbox"/> Structural Frames	8,671	<input type="checkbox"/> Problem Solving	3,128
<input type="checkbox"/> Data Handling	8,582	<input type="checkbox"/> Fire Extinguishers	3,077
<input type="checkbox"/> Aircraft Landing	8,499	<input type="checkbox"/> Electric Lines	3,059
<input type="checkbox"/> Clamping Devices	8,497	<input type="checkbox"/> Aircraft Accidents	3,056
<input type="checkbox"/> Navigation	8,422	<input type="checkbox"/> Extraction	3,023
<input type="checkbox"/> Digital Storage	8,367	<input type="checkbox"/> Signal Receivers	3,011
<input type="checkbox"/> Data Acquisition	8,306	<input type="checkbox"/> Spray Nozzles	3,005
<input checked="" type="checkbox"/> Flight Paths	8,265	<input type="checkbox"/> Image Processing	2,990
<input type="checkbox"/> Image Acquisition	8,257	<input type="checkbox"/> Intelligent Systems	2,968
<input type="checkbox"/> Secondary Batteries	8,202	<input type="checkbox"/> Hinges	2,849
<input type="checkbox"/> Aerial Photography	8,172		
<input type="checkbox"/> Screws	7,968		

View: 10 60 Max [Limit to] [Exclude]

Expert search (((((Drones or UAV or "unmanned aerial vehicles" or "autonomous aerial vehicles") WN ALL)) AND (((flight paths) AND (position control)) WN CV)) [Search]

126 records found in Patents Plus for 1790-2026: (((((Drones or UAV or "unmanned aerial vehicles" or "autonomous aerial vehicles") WN ALL)) AND (((flight paths) AND (position control)) WN CV))

CPC code

- G05D1/101 30
- B64U2201/10 18
- B64U2201/20 16
- B64U2101/30 13
- B64C39/24 11

[View more](#)

IPC code

- G05D1/10 59
- B64C39/02 37
- G05D1/08 14
- B64C13/18 13
- B64D47/08 13

[View more](#)

受控词精炼：位置控制（position control）与飞行路径 (Flight path)

列出关键 IPC/CPC代码

# 在Inspec数据库中，使用IPC/CPC代码检索非专利文献



Engineering Village

Search Search history Alerts Selected records More ?

Expert search

Databases Date Sort by Autostemming Search codes Browse indexes

Assignee Author Author affiliation  
Controlled term Discipline Document type  
**IPC Code** Inventor Language  
Source title Treatment

Engineering Village - Browse Index Lookup - ...  
https://www.engineeringvillage.com/sear...  
Search for: G05D1/00 Search index  
Selected index: IPC Code  
Click on letter below to browse index:  
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z  
Go Gb Gc Gd Ge Gf Gg Gh Gi Gj Gk Gl Gm Gn Go Gp Gq Gr Gs Gt Gu Gv Gw Gx Gy Gz  
Select terms below to add to search  
Connect terms with: AND OR  
 G05D1/00 - CONTROL OF POSITION, COURSE, ALTITUDE, OR ATTITUDE OF LAND, WATER, AIR, OR SPACE VEHICLES, E.G. AUTOMATIC PILOT (Inspec)  
Back to Top

Quick search IPC Code for G05D1/00

AND IPC Code for B64C13/18

Turn off AutoSuggest | + Add search field | Reset form

Databases Date Language Document type Sort by Browse indexes Autostemming Discipline Treatment

All  Compendex  Inspec  Patents Plus

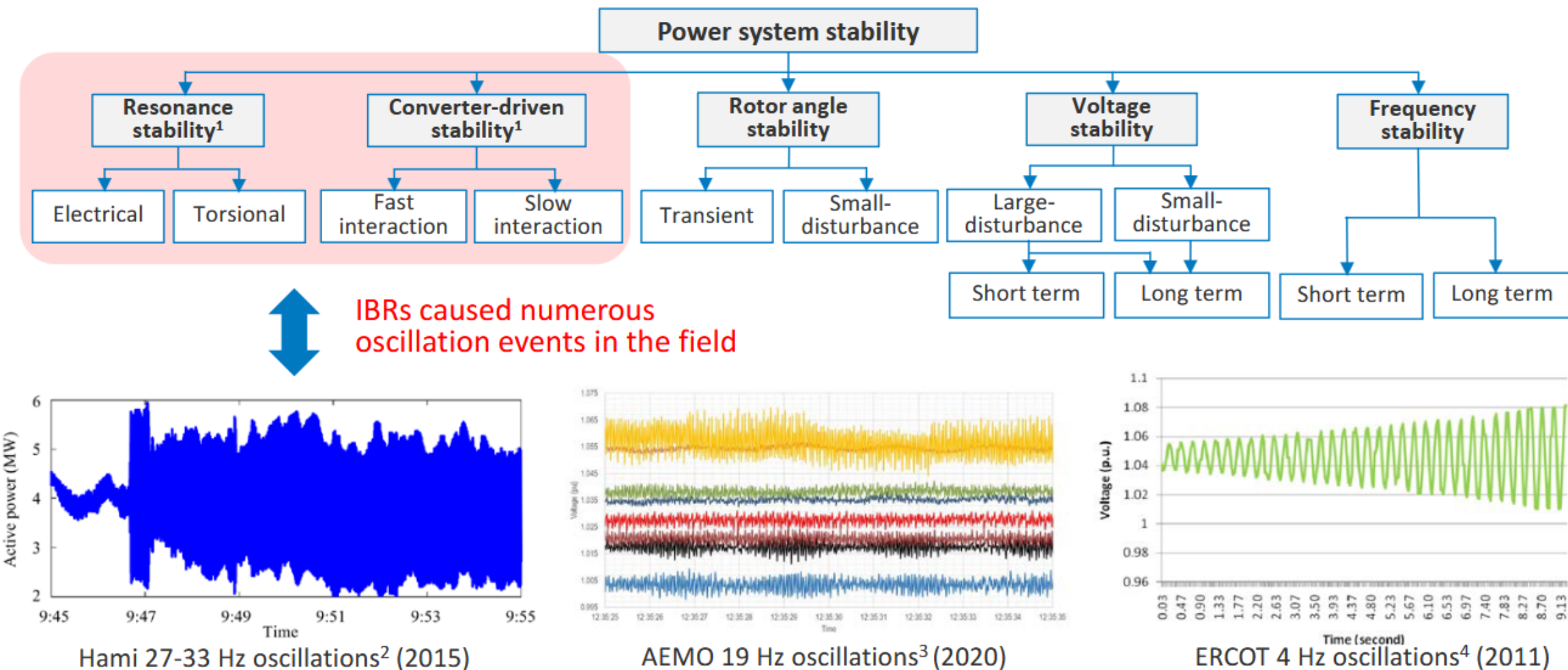
272 records found in Inspec for 1896-2026: (((G05D1/00) WN PID) AND ((B64C13/18) WN PID))

## 5. 案例实操，用Inspec数据库为文献综述精准高效查找文献

- 提出研究问题，提取核心研究要素
- 制定检索策略，文献检索（写综述）
- 识别“知识缺口”，判断研究可行性和价值

# 高 IBR 渗透率下电力系统的失稳问题

随着变流器型资源（IBR）增多，不稳定性问题加剧是电力系统领域的核心议题。IBR 主要指风电、光伏、储能等通过电力电子变流器并网的新型能源设备。其核心研究问题围绕系统惯量降低、控制交互、振荡失稳、电压 / 频率稳定四大维度。



Ref. <https://docs.nrel.gov> (美国国家可再生能源实验室)

# Inspec叙词表用于精准文献检索

## 案例：智能电网中分布式发电系统应用逆变器实现电压控制

### 1. "高太阳能渗透率电网中的电压调节：以夏威夷智能逆变器部署为例"

#### 2. 案例背景

分布式能源资源（DERs，如屋顶太阳能）的并网规模持续扩大，在夏威夷等地区尤为显著——当地某些区域的太阳能渗透率已超过60%。这种转变对传统电网管理提出了挑战，间歇性发电和反向功率流导致的电压波动问题日益突出。智能电网通过数字化技术提升稳定性，其中智能逆变器在电压控制中发挥着关键作用。

#### 3. 问题陈述

夏威夷的高太阳能渗透率导致频繁的过电压状况，特别是在午间发电量超过需求时。传统的电压调节器和变压器分接开关无法有效应对反向电流，存在设备损坏风险和太阳能发电的被迫削减问题。

#### 4. 解决方案：基于逆变器的电压控制

通过部署智能逆变器实现动态电压支撑，其核心机制是无功功率管理。

#### 5. 案例研究描述

地点：夏威夷毛伊岛（2018 - 2020年前后）

电网概况：40兆瓦住宅太阳能容量，12千伏配电馈线

核心挑战：太阳能发电高峰期电压骤升高达标称值的110%



图片来源: <https://palmetto.com>

Science drives Inspec.

Inspec drives innovation.

感谢各位参会老师的关注，

请您批评指正！

联系我们：

[CLiu@theiet.org](mailto:CLiu@theiet.org)