



中国科学院大学

University of Chinese Academy of Sciences

外文文献检索工具介绍与应用

吴鸣



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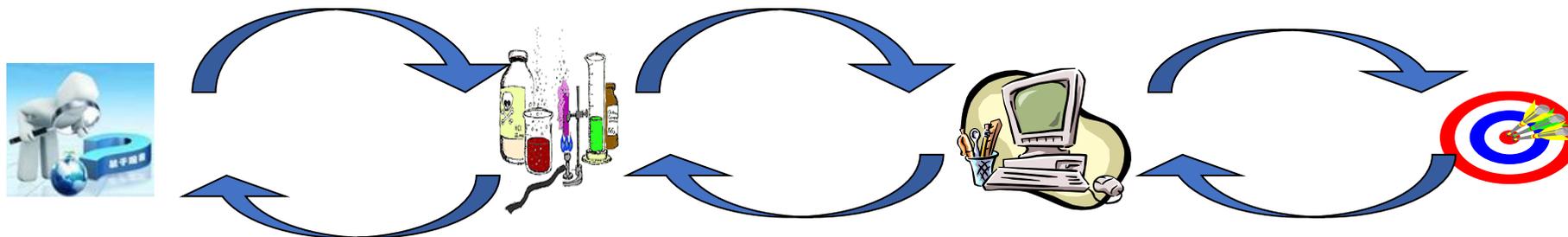
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Engineering Village (EI)





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- 科学研究是一种具有连续性、继承性、创造性劳动
- 科技文献贯穿科学研究生命周期全过程



科技文献类型：按加工深度来分

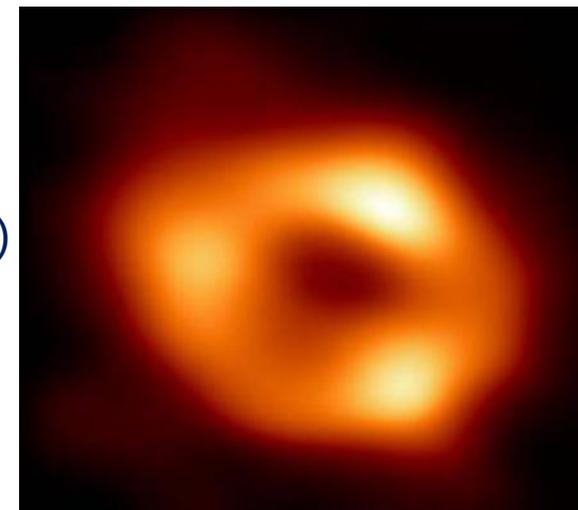




➤ 建立背景知识，分析研究问题：天文望远镜为例

5月13日《天体物理学杂志通讯》发布首张银河系中心超大黑洞图片

- 观测证实了被称为人马座A* (Sgr A*) 的黑洞的存在
- 全球8个射电望远镜合作完成，虚拟望远镜被命名为：事件视界 (Event Horizon)



检索结果: 1



镜收眼底：天文望远镜中的星空

PISBN : 9787030449702

出版时间：2015-07-01

作者：张唯斌



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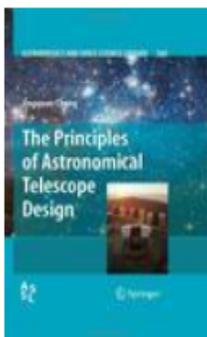
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Astronomical Telescope

检索结果: 1



The Principles of Astronomical Telescope Design

出版社：Springer New York

EISBN：9780387887913

出版时间：2009

作者：Jingquan Cheng

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Jingquan Cheng



随着天文观测的极限不断向外延伸，现代天文望远镜的灵敏度和精度不断的提高，现代天文望远镜成为了名副其实的代表技术发展最高水平的重大科研基础设施，现代天文学被公认为“大学科”。

主动光学技术、自适应光学技术、人造激光星技术、斑点干涉技术、振幅干涉技术、全息面形检测技术、红外调制技术、光学桁架技术、光谱平面天线技术、隐形技术等。

射电天文望远镜 Radio Telescope , Radio Astronomical Telescope



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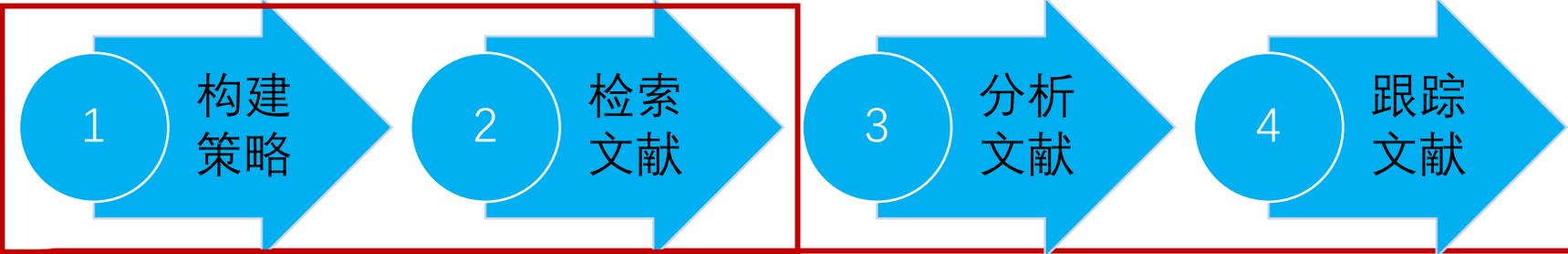
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"Radio Telescope*" or "Radio Astronom* Telescope*"



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1 RADIO ASTRONOMY Telescope Project Splits Array to Avoid Division

Jun 1 2012 | SCIENCE 336 (6085) , pp.1085-1085

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2 Signal Processing for Phased Array Feeds in Radio Astronomical Telescopes

Oct 2008 | IEEE JOURNAL OF SELECTED TOPICS IN SIGNAL PROCESSING 2 (5) , pp.635-646

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Relative to traditional waveguide feeds, phased array feeds (PAFs) for radio telescopes can increase the instrument field of view and sky survey speed. Unique challenges associated with PAF observations, including extremely low signal levels, long-term system gain stability requirements, spatially correlated noise due to mutual coupling, and tight beamshape tolerances, require the development of

3 RFI profiles of prime candidate sites for the first radio astronomical telescope in Malaysia

Mar 2010 | NEW ASTRONOMY 15 (3) , pp.307-312

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Radio astronomy is a very young research field in South East Asia. There has not been a research-grade radio telescope built in this part of the world yet. A plan has been proposed by the University of Malaya's Radio Cosmology Research Laboratory to build a medium-sized radio telescope in order to eventually join the global projects of the Very Long Baseline Interferometry (VLBI) Network and Sq



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1 Galaxy rotation curve measurements with low cost 21 cm radio telescope

Pandian, P.; Ganesh, L.; Prabu, T

Jun 2022 | SADHANA-ACADEMY PROCEEDINGS IN ENGINEERING SCIENCES 47 (2)

被引参考文献深度分析

Probing the Universe with atomic hydrogen 21 cm emission is a fascinating and challenging work in astronomy. Radio telescopes play a vital role in detecting and imaging these faint signals. Powerful radio telescopes are complex to construct and operate. We have built a simple, low-cost 21 cm radio telescope primarily for educational training purposes. The design uses a custom horn antenna, read ... 显示更多

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2 Study of the equatorial ionosphere using the Giant Metrewave Radio Telescope (GMRT) at sub-GHz frequencies

Mangla, S and Datta, A

Apr 26 2022 | MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY 513 (1), pp.964-975

Radio interferometers, which are designed to observe astrophysical objects in the universe, can also be used to study the Earth's ionosphere. Radio interferometers like the Giant Metrewave Radio Telescope (GMRT) detect variations in ionospheric total electron content (TEC) on a much wider spatial scale at a relatively higher sensitivity than traditional ionospheric probes like the Global Naviga ... 显示更多

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1 THE FIVE-HUNDRED-METER APERTURE SPHERICAL RADIO TELESCOPE (FAST) PROJECT

Nan, RD; Li, D; (...); Qian, L

Jun 2011 | INTERNATIONAL JOURNAL OF MODERN PHYSICS D 20 (6) , pp.989-1024

Five-hundred-meter Aperture Spherical radio Telescope (FAST) is a Chinese mega-science project to build the largest single dish radio telescope in the world. Its innovative engineering concept and design pave a new road to realize a huge single dish in the most effective way. FAST also represents Chinese contribution in the international efforts to build the square kilometer array (SKA). Being ... 显示更多

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2 THE GIANT METER-WAVE RADIO TELESCOPE

SWARUP, G; ANANTHAKRISHNAN, S; (...); KULKARNI, VK

Jan 25 1991 | CURRENT SCIENCE 60 (2) , pp.95-105

The Giant Metre-wave Radio Telescope, an aperture-synthesis array consisting of 30 fully steerable parabolic dishes of 45-m diameter each, is being set up about 80 km north of Pune as a national facility for frontline research in radio astronomy in the frequency range 38 MHz to 1420 MHz. The new and novel design of a low-solidity dish for metre-wave operation, in which a thin wire mesh (varyin ... 显示更多

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Nan, RD; Li, D; (...); Qian, L

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2 Five hundred meter aperture spherical radio telescope (FAST)

Nan, RD

Apr 2006 | SCIENCE IN CHINA SERIES G-PHYSICS MECHANICS & ASTRONOMY 49 (2), pp.129-148

Five hundred meter aperture spherical radio telescope (FAST) will be the largest radio telescope in the world. The innovative engineering concept and design pave a new road to realizing a huge single dish in the most effective way. Three outstanding features of the telescope are the unique karst depressions as the sites, the active main reflector which corrects spherical aberration on the ground ... 显示更多

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2 The latest progress of Five-hundred-meter Aperture Spherical radio Telescope

Jiang, P and Yao, R

Dec 2021 (在线发表) | SCIENCE CHINA-TECHNOLOGICAL SCIENCES

Five hundred meter aperture spherical radio telescope (FAST) will be the largest radio telescope in the world. The innovative engineering concept and design pave a new road to realizing a huge single dish in the most effective way. Three outstanding features of the telescope are the unique karst depressions as the sites, the active main reflector which corrects spherical aberration on the ground ... 显示更多

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Nan, R.D.; Li, D.; Qian, L. Jun 2011 | INTERNATIONAL JOURNAL OF MODERN PHYSICS D 20 (6) , pp.989-1024
Five-hundred-meter Aperture Spherical radio Telescope (FAST) is a Chinese mega-science project to build the largest single dish radio telescope in the world. Its innovative engineering concept and design pave a new road to realize a huge single dish in the most effective way. FAST also represents Chinese contribution in the international efforts to build the square kilometer array (SKA). Being ... 显示更多
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- 2 A semi-empirical simulation of the extragalactic radio continuum sky for next generation radio telescopes 278 被引频次
Wilman, R.J.; Miller, L.; Young, S. Aug 11 2008 | MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY 388 (3) , pp.1335-1348
We have developed a semi-empirical simulation of the extragalactic radio continuum sky suitable for aiding the design of next generation radio interferometers such as the Square Kilometre Array (SKA). The emphasis is on modelling the large-scale cosmological distribution of radio sources rather than the internal structure of individual galaxies. Here we provide a description of the simulation t ... 显示更多
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2 HI study of extremely metal-deficient dwarf galaxies - I. The Nancay radio telescope observations of twenty-two objects

Pustilnik, SA and Martin, JM

Mar 2007 | ASTRONOMY & ASTROPHYSICS 464 (3) , pp.859-869

Aims. The goal of this study is to measure parameters of the integrated HI emission for twenty- two dwarf galaxies with oxygen abundance $12 + \log(O/H)$ in the range of 7.42 to 7.65, which are representatives of the eXtremely Metal- Deficient (XMD) galaxy group. Some of them are expected to be similar to the well- known candidates for local young galaxies, I Zw 18 and SBS 0335- 052 that have m ... 显示更多

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THE FIVE-HUNDRED-METER APERTURE SPHERICAL RADIO TELESCOPE (FAST) PROJECT

作者: Nan, RD (Nan, Rendong) [1], [2]; Li, D (Li, Di) [1], [3]; Jin, CJ (Jin, Chengjin) [1]; Wang, QM (Wang, Qiming) [1]; Zhu, LC (Zhu, Lichun) [1]; Zhu, WB (Zhu, Wenhai) [1]; Zhang, HY (Zhang, Haiyan) [1], [2]; Yue, YL (Yue, Youling) [1]; Qian, L (Qian, Lei) [1]

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INTERNATIONAL JOURNAL OF MODERN PHYSICS D

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DOI: 10.1142/S0218271811019335

出版时间: JUN 2011

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文献类型: Review

摘要

Five-hundred-meter Aperture Spherical radio Telescope (FAST) is a Chinese mega-science project to build the largest single dish radio telescope in the world. The engineering concept and design pave a new road to realize a huge single dish in the most effective way. FAST also represents Chinese contribution in the international efforts to build the square kilometer array (SKA). Being the most sensitive single dish radio telescope, FAST will enable astronomers to jump-start many science goals, such as surveying the neutral hydrogen in the Milky Way and other galaxies, detecting faint pulsars, looking for the first shining stars, hearing the possible signals from other civilizations, etc.

The idea of sitting a large spherical dish in a karst depression is rooted in Arecibo telescope. FAST is an Arecibo-type antenna with three outstanding aspects: the karst depression used as the site, which is large to host the 500-meter telescope and deep to allow a zenith angle of 40 degrees; the active main reflector correcting for spherical aberration on the ground to achieve a full polarization and a wide band without involving complex feed systems; and the light-weight feed cabin driven by cables and servomechanism plus a parallel robot as a secondary adjustable system to move with high precision. The feasibility studies for FAST have been carried out for 14 years, supported by Chinese and world astronomical communities. Funding for FAST has been approved by the National Development and Reform Commission in July of 2007 with a capital budget similar to 700 million RMB. The project time is 5.5 years from the commencement of work in March of 2011 and the first light is expected to be in 2016.

This review intends to introduce the project of FAST with emphasis on the recent progress since 2006. In this paper, the subsystems of FAST are described in modest details followed by discussions of the fundamental science goals and examples of early science projects.

关键词

作者关键词: Radio telescope; active main reflector; HI 21cm line; pulsar

Keywords Plus: GALACTIC PLANE SURVEY; ALPHA SURVEY; REFLECTOR; GALAXIES; EMISSION; DESIGN; CLOUDS

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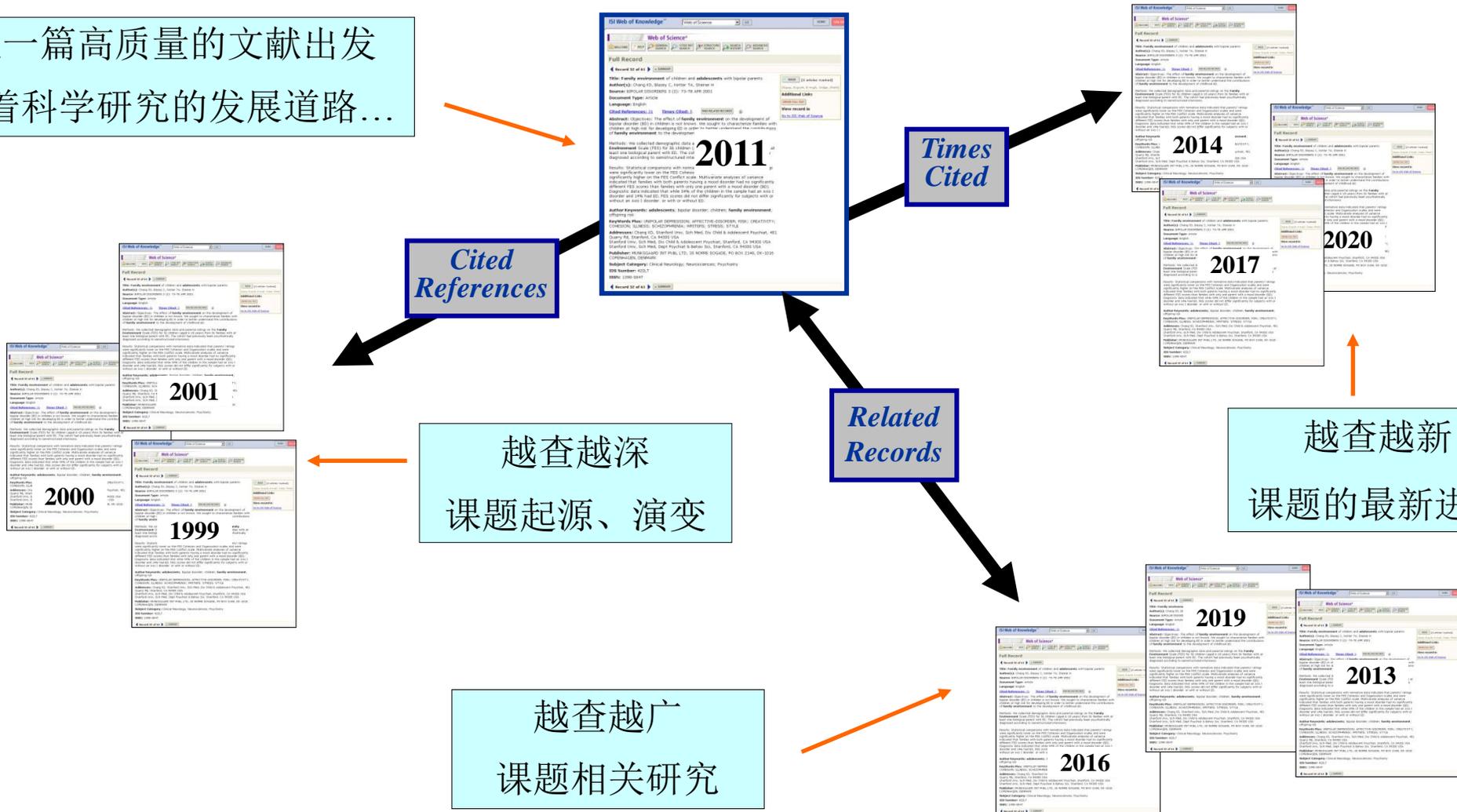
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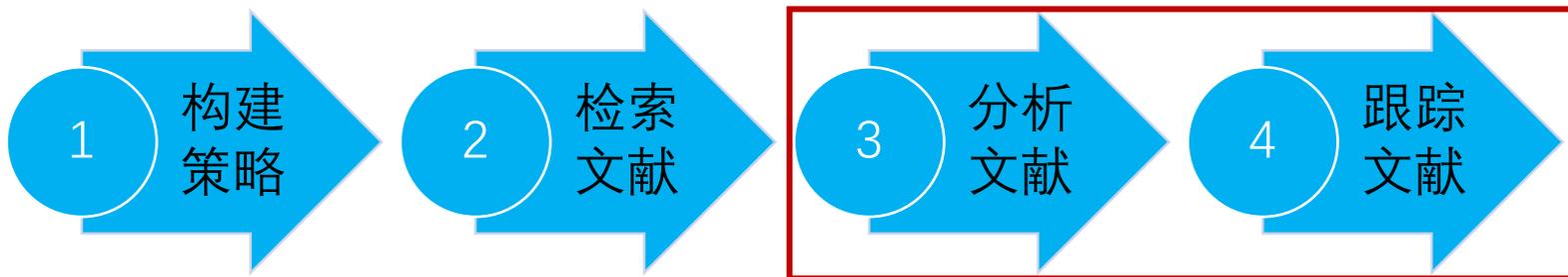
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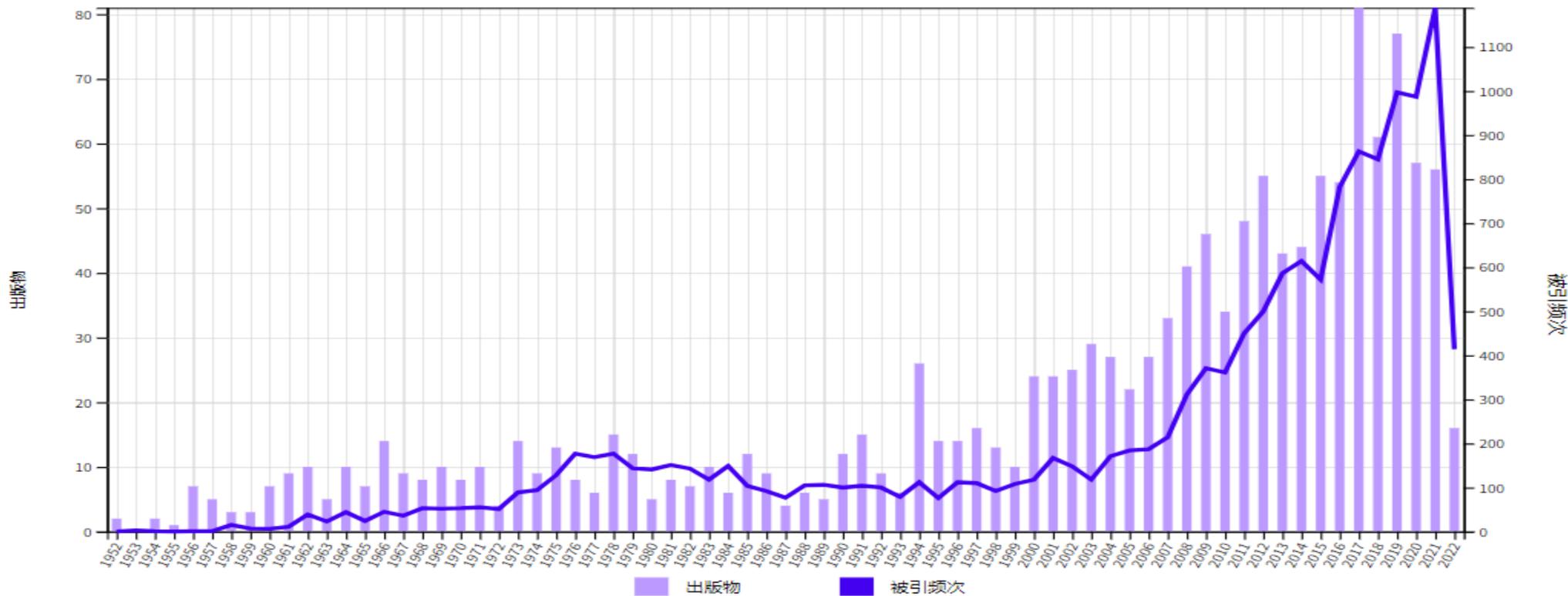
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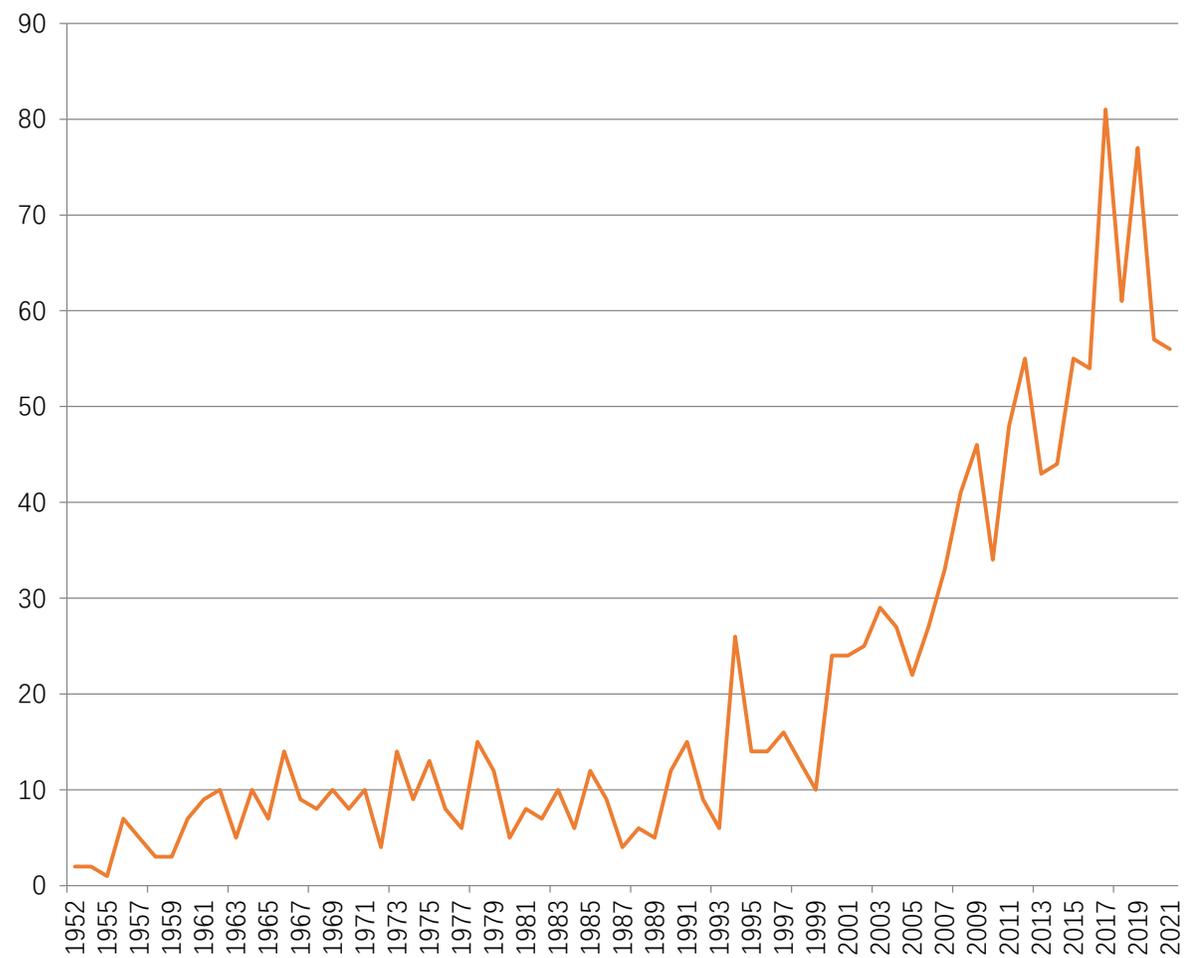




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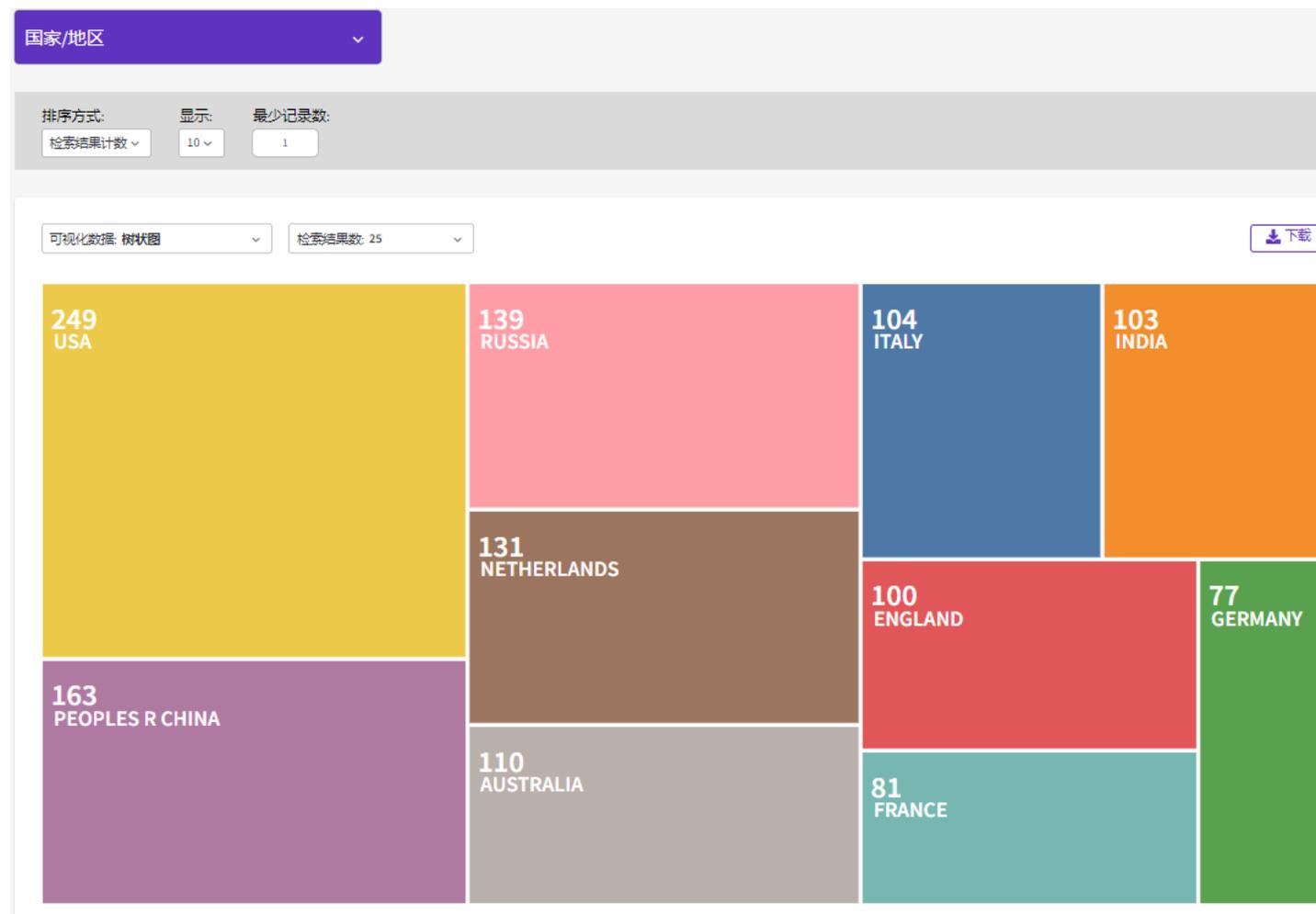




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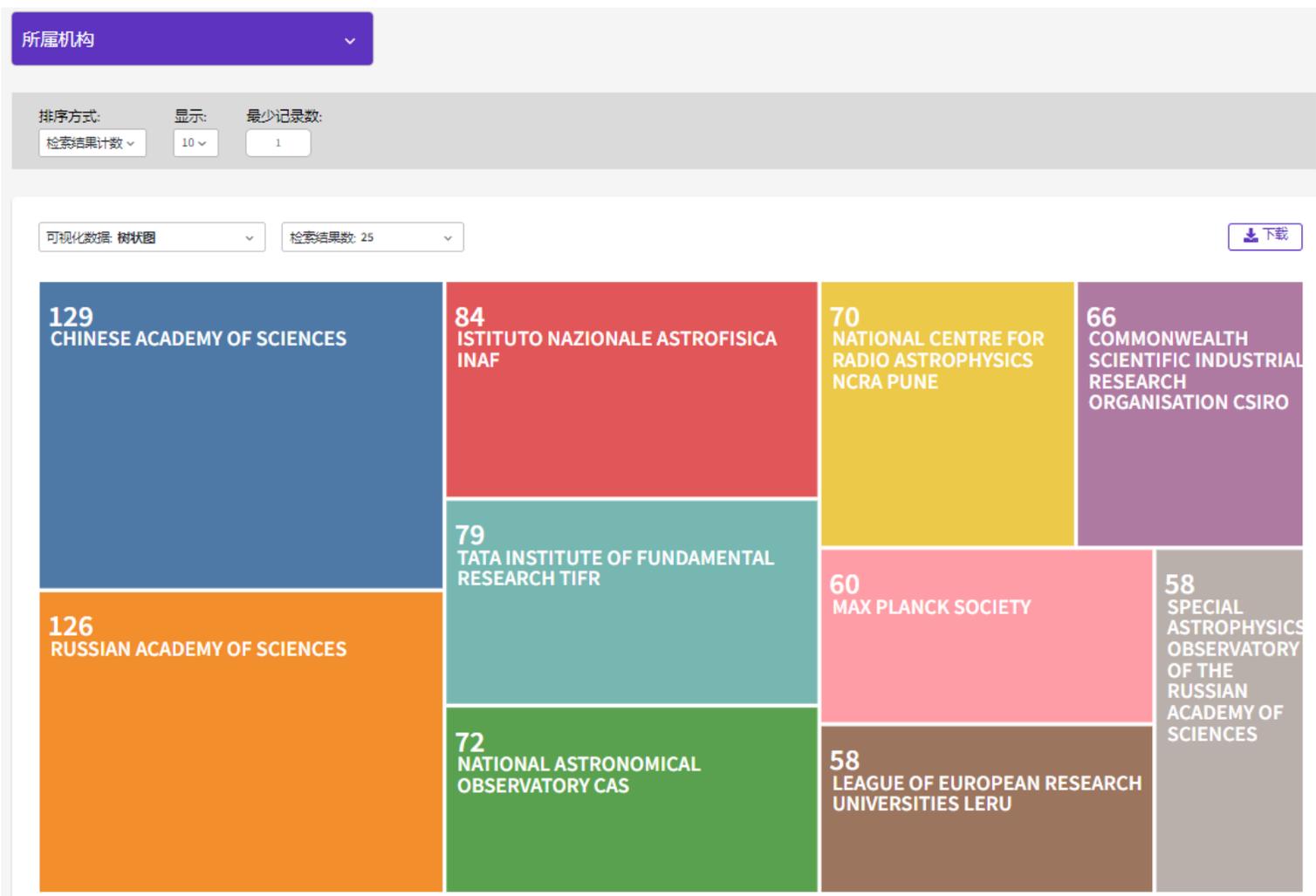
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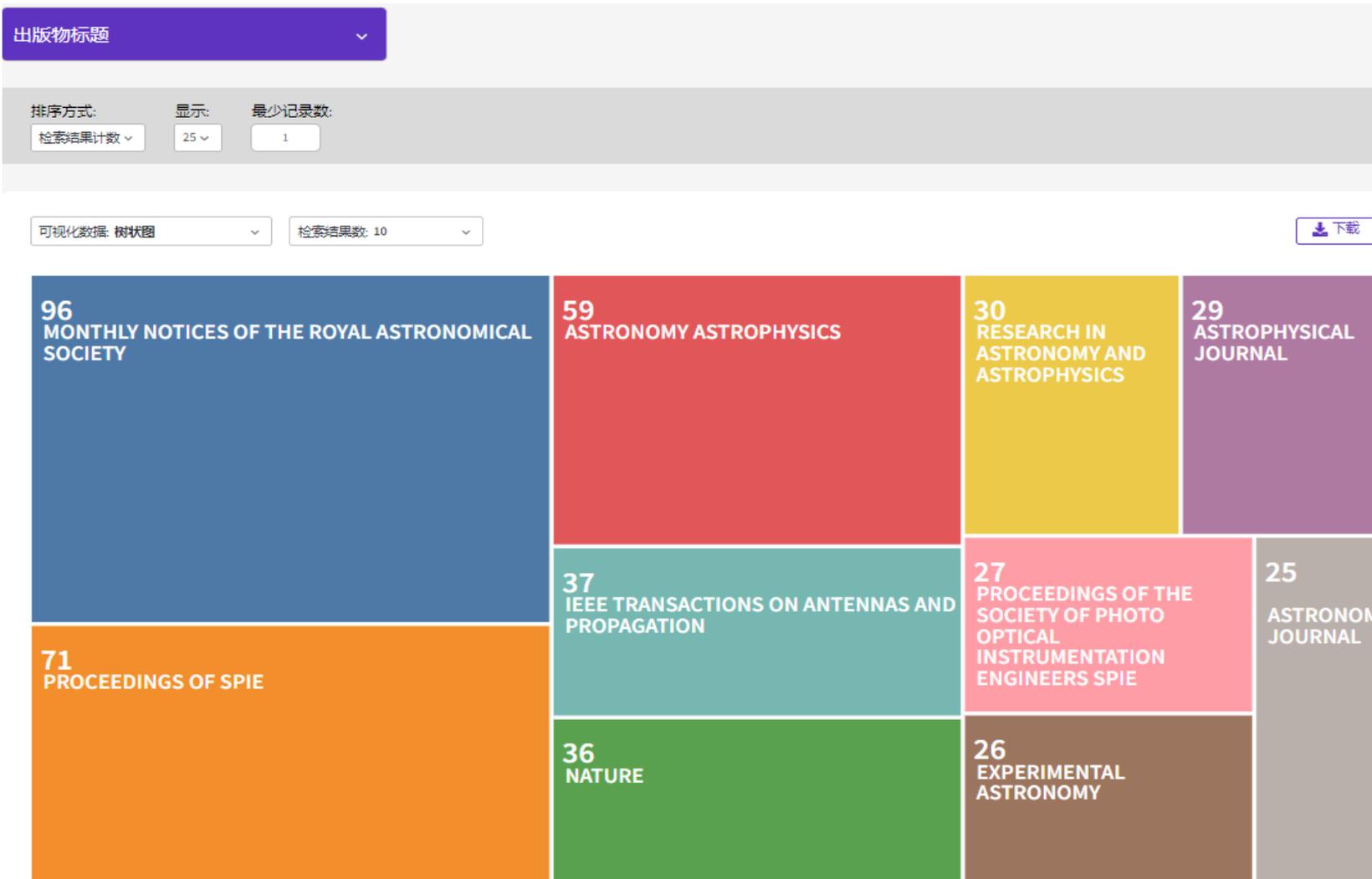




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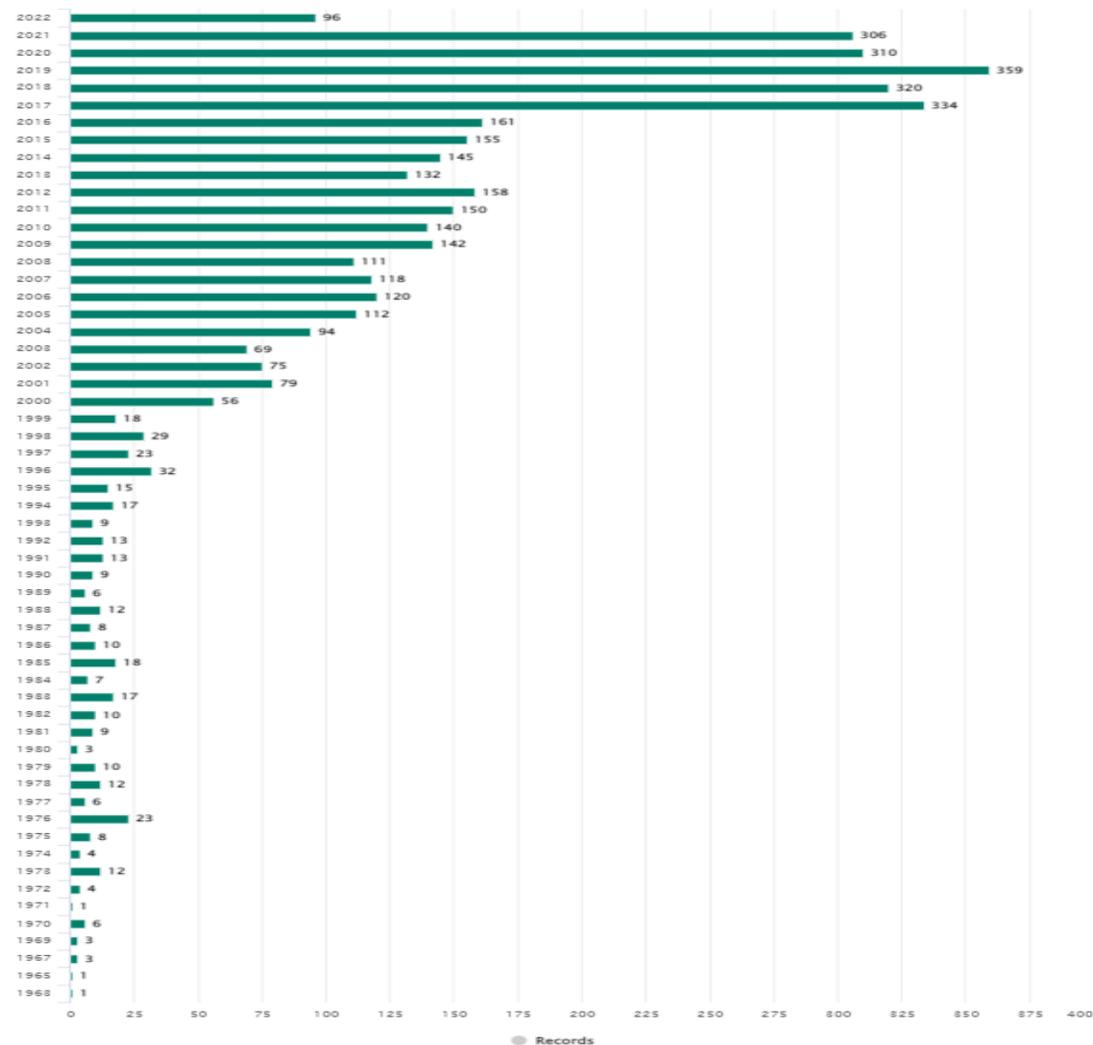
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Abstract

Surface segmentation design is a conceptual problem in the structural design of large radio telescope antennas. Before performing surface segmentation optimization, a weighting level set topology optimization method is proposed for the antenna backup supporting structure from the viewpoint of continuum topology optimization. With the help of weighting level set topology optimization, a clear and compact backup supporting structure is acquired. Taking the optimized topology backup supporting structure as the design basis, a surface segmentation optimization scheme is presented and extended to the full aperture. By employing this method in the conceptual surface segmentation design of two large radio telescope antenna applications, the effectiveness of this method is easily illustrated.

Introduction

Due to the advantages of high gain, high working frequency, and low cost, large radio telescope antennas are widely utilized in radio astronomy applications (Chahat et al. 2020;

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