# A Scientometric Study on Indian Journal of Pure and Applied Physics (2008-2012)

**S. Jancy**
Guest Lecturer, Department of Library and Information Science, Periyar University, Salem

**R. Hariharan**
MLIS, Department of Library and Information Science, Periyar University, Salem

**N. Subramanian**
University Librarian & Headi/c, Department of Library and Information Science, Periyar University, Salem

Abstract

*This paper presents the results of a Scientometric analysis of Indian Journal of pure and applied physics. A list of articles on various aspects of contribution of research articles published duing 2008-2012 was taken for this study. A total of 690 articles in five volumes 46(2008) to volumes 50(2012) were identified in the Indian Journal of Pure and Applied Physics. The five-yearly distribution of Indian journal of pure and applied physics has been carried out to observe the number of contributions and their distribution in different volumes, authorship pattern, special issues published during 2008 to 2012, number of pages used in each volume*

Keywords

Scientometric Study, Indian Journal of Pure and Applied Physics.

Electronic access

The journal is available at www.jalis.in


**Journal of Advances in Library and Information Science**
ISSN: 2277-2219 Vol. 2 No.3. 2013. pp. 118-123

## INTRODUCTION

Scientometrics is a branch of science. Scientometricians explain about input and outputs resource in terms of organizational structure. They develop benchmarks to evaluate the quality of information resources and packages of information for decision making in science. It provides a key opportunity to the researcher to publish their articles with new strategies, innovations, new methods and new ideas. Indian journal of physics highly helpful in the field of astrophysics, atmospheric and space physics, bio-physics and so on. They define appropriate data aggregation producers and methods for diachronic analysis.

They empirically describe the constantly changing relationships between science, technology and the market. They forecast productivity of scientists, so that dynamics of scientific research and technological development can be understood. This consequently sheds more light on our knowledge of the structure of subject of literature and better organization of information resources which can ultimately be effectively used. In this paper an attempt has been made by the research to reveal the trends towards the increase and quality of research articles in Science discipline.

In this paper an attempt has been made to analyze the contributions to Indian Journal of pure and applied physics published the year 2008-2012, in order to explore the source of article analysis, and authorship productivity analysis of papers among the contributions. This study covers the 690 articles of 60 issues published.

## SOURCE:

Indian journal of pure and applied physics (IJPAP) was selected as the source journal of the present research study. The journal was started in 1963 and published monthly, National institute of science communication & information resources (NISCAIR) & premier institution of CSIR, New Delhi. It Serve as an information link between generators and users of technologies and address to scientists, humanities, engineers, and technologists on one hand and planners, administers and managers on the other. Original has research articles of interest to full papers, notes industry, reviews and technologies applications are the major coverage of publications.

The Journal publisher articles in the following broad subject heading.

- Classical Mechanics

- Fluid Mechanics
- Pneumalives (Gas mechanics)
- Sound & related vibrations
- Lights, & related radiation
- Heat
- Electricity & electronics
- Magnetism
- Modern physics.

**OBJECTIVES:**

The objectives of the study are as follows

1. To find out distribution of contributions at volume and issue wise.
2. To examine the authorship pattern and author productivity.
3. To find out the special issues published in an article.
4. To determine the degree of collaboration.
5. To find out the distribution of contribution in subject wise.
6. To find out the average length of papers.

**METHODOLOGY:**

The Indian journal of pure and applied physics for analysis of article s for the period of 2008-2012 (Vol. No. 46 to Vol. No. 50), each volumes of the journal was studied in order to ascertain number of authors, umber of subjects, number of special issues, number of author and coverage papers per volume.

**RESULT AND DISCUSSION:**

The data analyzed at the three titles. There are source of article analysis, authorship productivity analysis and page distribution analysis, these results are as follows.

Table: 01 shows the distribution of research articles published in Indian journal & pure applied physics during 2008-2012. The total of 690 contributions was published with an average 138 articles per year average. The highest number of contribution by the 2012; 149 articles, 2009; 136 articles and the lowest number of articles were published in the year is 2011; 121 articles (17.54%). The average number of papers is 138 during the study and the similar type of result has been dream by Umamaheswari S in the journal of Agranomy and Dr. P Rajendran etc., in the international journal of digital library services
In table shows This table shows that the subject wise distribution of the highest volume of 163 (31.58 %) is condensed matter structure, mechanical and thermal properties and the lowest volume of 4 (0.78%) the physics and field review author respectively.

**Table 1: Distribution of Contribution (Volume-wise)**

| Month | Year / Volume Number | | | | | Total |
|---|---|---|---|---|---|---|
| | 2008 / 46 | 2009 / 47 | 2010 / 48 | 2011 / 49 | 2012 / 50 | 5 Volumes |
| January | 12 | 11 | 10 | 11 | 10 | 54 |
| February | 10 | 11 | 11 | 10 | 10 | 52 |
| March | 11 | 10 | 09 | 11 | 08 | 49 |
| April | 10 | 11 | 11 | 10 | 10 | 52 |
| May | 12 | 12 | 10 | 11 | 11 | 56 |
| June | 23 | 19 | 11 | 12 | 09 | 73 |
| July | 11 | 11 | 19 | 09 | 27 | 77 |
| August | 10 | 11 | 11 | 10 | 08 | 50 |
| September | 11 | 10 | 12 | 09 | 08 | 50 |
| October | 12 | 10 | 09 | 10 | 08 | 49 |
| November | 10 | 10 | 17 | 09 | 32 | 69 |
| December | 12 | 10 | 10 | 09 | 08 | 49 |
| **Total** | **144** | **136** | **140** | **121** | **149** | **690** |
| **Percentage (%)** | **20.87** | **19.71** | **20.29** | **17.54** | **21.59** | **100** |
| **Issues** | **12** | **12** | **12** | **12** | **12** | **60** |

**Table 2: Distribution of Contribution (Subject wise)**

| Subject | No. of Contribution | | | | | Total | Percentage (%) |
|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | | |
| Nuclear Physics | 05 | 07 | 04 | 03 | 03 | 22 | 4.26 |
| Atomic and Molecular | 24 | 23 | 17 | 23 | 20 | 107 | 20.74 |
| Electromagnetism, Optics, Acoustics, Heat Transfer, Classical Mechanics and Classical Mechanics and Fluid Dynamics | 06 | 13 | 08 | 13 | 14 | 54 | 10.46 |
| Condensed Matter: Structure, Mechanical and Thermal Properties | 25 | 33 | 19 | 39 | 47 | 163 | 31.58 |
| Condensed Matter: Electronic Structure, Electrical, Magnetic and Optical Properties | 12 | 17 | 20 | 24 | 17 | 90 | 17.44 |
| Physics of Gases, Plasmas and Electric Discharges | 04 | 07 | 02 | 02 | 04 | 19 | 3.68 |
| Interdisciplinary Physics and Related Areas of Science and Technology | 06 | 09 | 08 | 08 | 07 | 38 | 7.36 |
| General | 04 | 03 | 01 | 04 | 03 | 15 | 2.91 |
| The Physics of Elementary Particles and Fields | - | 01 | - | 01 | 02 | 04 | 0.78 |
| Review Article | - | - | 03 | - | 01 | 04 | 0.78 |

**Table 3: Special Issue published during 2008 to 2012**

| Year | Special Issues | Volume No. | Issue No. | No. of Contribution |
|---|---|---|---|---|
| **2008** | Condensed Matter and Materials Physics | 46 | 6 | 23 |
| **2009** | Luminescence and its Applications | 47 | 6 | 19 |
| **2010** | Accelerators and Low Level Radiation Safety — Part 1 | 48 | 07 | 19 |
| | Accelerators and Low Level Radiation Safety — Part 2 | 48 | 11 | 17 |
| **2011** | - | - | - | - |
| **2012** | Emerging Trends in Accelerator Radiation Safety — Part I | 50 | 07 | 27 |
| | Emerging Trends in Accelerator Radiation Safety — Part II | 50 | 11 | 32 |
| **No. of Special Issues Contribution** | | **137(19.86%)** | | |
| **No. of Issues Contribution** | | **553 (80.14%)** | | |
| **Total No. of Contribution** | | **690 (100%)** | | |

The above table 3 shows that the conferences conducted one conference the June month that the year of 2010- 2012 has conducted the conference July & November respectively; there is no special issues in the year of 2011.

**Authorship Productivity Analysis:**

The percapita publications = No. of items / No. of Authors = 690/635 = 1.09
The percapita publication works out to 1.09

**Degree of Collaboration:**

The analysis of single vs. multiple authored papers developed the following facts. In recent decades there has been an increasing trend science. Subramanian has deducted a formula for calculating the degree of collaboration as
C= Nm/Nm + Ns
Ns = 55, Nm = 635
C = 635/635+55 = 0. 92

The analysis of the extent of collaboration in the publications in Indian Journal of Pure and Applied Physics works out to 0. 92.

**Table 4: Single vs. Multiple authors**

| Year | Single | % | Multiple | % | Total | % |
|---|---|---|---|---|---|---|
| 2008 | 09 | 16.36 | 135 | 21.26 | 144 | 20.87 |
| 2009 | 10 | 18.18 | 126 | 19.85 | 136 | 19.71 |
| 2010 | 11 | 20.00 | 129 | 20.31 | 140 | 20.29 |
| 2011 | 12 | 21.82 | 109 | 17.17 | 121 | 17.54 |
| 2012 | 13 | 23.64 | 136 | 21.42 | 149 | 21.59 |
| **Total** | **55** | **100** | **635** | **100** | **690** | **100** |

**Table 5: Authorship Patterns of Contributions**

| No. of Authors | No. of Contributions | Cumulative | Percentage % | Cumulative % |
|---|---|---|---|---|
| One | 055 | 55 | 07.97 | 07.97 |
| Two | 195 | 250 | 28.26 | 36.23 |
| Three | 183 | 433 | 26.52 | 62.75 |
| Four | 111 | 544 | 16.09 | 78.84 |
| Five | 075 | 619 | 10.87 | 89.71 |
| More than Five | 071 | **690** | 10.29 | **100** |
| **Total** | **690** | **-** | **100** | **-** |

The authorship pattern of contributions, shown the table: 05 single another contributed (their new ideas physics at 55; 7.97%. The highest no of articles contribution is two authors are 195; 28.26%, three authors are 183; 26.52%, four authors are 111; 16.09%, five authors are10.87% and the lowest no of articles more than five authors 71; 10.29%

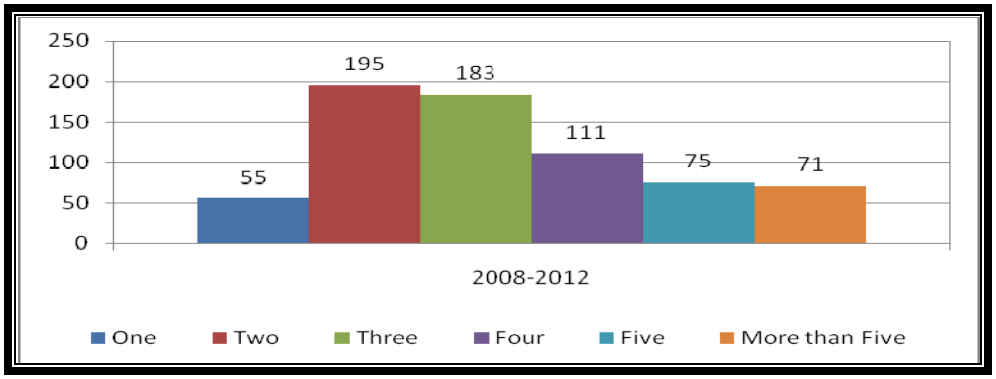


***Figure: 1Authorship Patterns of Contributions***

**Table: 06 Authorship Patterns of Contributions**

| Vol. No. | One Author | % | Two Authors | % | Three Authors | % | Four Authors | % | Five Authors | % | More then Five Authors | % | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 09 | 16.36 | 41 | 21.02 | 35 | 19.13 | 33 | 29.73 | 15 | 20.00 | 11 | 15.49 | 144 | 20.87 |
| 47 | 10 | 18.18 | 50 | 25.64 | 30 | 16.39 | 15 | 13.51 | 18 | 24.00 | 13 | 18.31 | 136 | 19.71 |
| 48 | 11 | 20.00 | 31 | 15.90 | 39 | 21.31 | 24 | 21.62 | 19 | 25.33 | 16 | 22.54 | 140 | 20.29 |
| 49 | 12 | 21.82 | 34 | 17.44 | 42 | 22.95 | 17 | 15.32 | 08 | 10.67 | 08 | 11.27 | 121 | 17.54 |
| 50 | 13 | 23.64 | 39 | 20.00 | 37 | 20.22 | 22 | 19.82 | 15 | 20.00 | 23 | 32.39 | 149 | 21.59 |
| **5 Volumes** | **55** | **100** | **195** | **100** | **183** | **100** | **111** | **100** | **75** | **100** | **71** | **100** | **690** | **100** |

The highest author contributed to single author in the year of 50th 2012 volume of 13; 23.64%, and the lowest single author contribution in the year of 2008 to 46th volume of 09; 16.36%. The two authors highest contributed in the year 2008 to 46th volume of 41; 21.02%, the lowest contributed in the year 2010 of 48th volume 31; 15.90%.

Three authors highest contributed in the year 2011 of 42; 22.95% and the lowest contributed in the year 2009 of 30; 16.39%. Four Authors are highest contributed in the year 2008 of 33; 29.73% and the lowest contributed in the year 2009 of 15; 13.51%.

The lowest contributed in the year 2011 of 8; 10.67% and the highest contributed in the year 2009 of 18; 24% for five authors. The lowest contributed in the year 2011 of 8; 11.27% and the highest contributed in the year 2012 of 23; 32.39% for more than five authors.

**Page Distribution**

Table 09 reveals the average papers per volumes per contribution.

Average pages per volumes =4504/5 = 900.8
Average pages per issues =4504/60 = 75.07
Average pages per contribution =4504/690 = 6.52

**Table 7 : Average Pages : Per Volume**

| Vol. No. | Total Pages | No. of Contributions | Average |
|---|---|---|---|
| 46 | 905 | 144 | 6.28 |
| 47 | 889 | 136 | 6.54 |
| 48 | 913 | 140 | 6.52 |
| 49 | 857 | 121 | 7.08 |
| 50 | 940 | 149 | 6.31 |
| Total | 4504 | 690 | 6.52 |

Table: 07 shows that 690 articles published with a total page of 4504 (average 6.52 pages per article) during the year 2008 -2012. it is observed that the average length of the articles varied from a minimum of 6.28 pages to a maximum of 7.08 pages. The similar type of result has been drawn by Kamal Lochan Jena in the Indian Journal of Pure and Applied Physics. The year 2008 has highest average per paper with 6.28 pages while the year 2011 has the lowest average pages with 7.08.

The above table08 shows that the distributions of pages in Volumes wise and no. of pages in each issue.

**Table 8: Distributions of Pages (Volume-wise) & No. of Pages in Each Issue**

| Month | Volume Number | | | | |
|---|---|---|---|---|---|
| | 46 | 47 | 48 | 49 | 50 |
| January | 65(001-065) | 66(001-066) | 70(001-070) | 64(001-064) | 64(001-064) |
| February | 74(066-139) | 83(067-149) | 75(071-145) | 78(065-142) | 69(065-133) |
| March | 76(140-215) | 71(150-220) | 75(146-220) | 72(143-214) | 66(134-199) |
| April | 68(216-283) | 90(221-310) | 72(221-292) | 70(215-284) | 73(200-272) |
| May | 72(284-355) | 73(311-383) | 71(293-363) | 70(285-354) | 67(273-339) |
| June | 96(356-451) | 76(384-459) | 72(364-435) | 69(355-423) | 67(340-411) |
| July | 70(452-521) | 67(460-530) | 92(436-527) | 71(424-494) | 72(412-534) |
| August | 72(522-593) | 79(531-597) | 73(528-600) | 77(495-571) | 66(535-600) |
| September | 74(594-667) | 79(598-676) | 76(601-676) | 68(572-639) | 70(601-670) |
| October | 71(668-738) | 69(677-745) | 73(677-749) | 72(640-711) | 69(671-739) |
| November | 71(739-809) | 78(746-823) | 88(750-837) | 65(712-776) | 135(740-874) |
| December | 96(810-905) | 66(824-889) | 76(838-913) | 81(777-857) | 66(875-940) |
| **Total** | **905** | **889** | **913** | **857** | **940** |
| **Percentage (%)** | **20.09** | **19.73** | **20.27** | **19.02** | **28.87** |

**Table 09: Visitors: (Online Journal)**

| Issues | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| 1 | 1709 | 2743 | NA | 2782 | 3434 |
| 2 | 1528 | 2441 | NA | 2686 | 2979 |
| 3 | 1402 | 1989 | 2162 | 2354 | 3155 |
| 4 | 1089 | 1873 | 3536 | 2061 | 3366 |
| 5 | 1259 | 1859 | 1860 | 2208 | 2465 |
| 6 | 1147 | 1481 | 2880 | 2240 | 3869 |
| 7 | 1120 | 1327 | 2773 | 1956 | 2200 |
| 8 | 1044 | 1195 | 2320 | 1943 | 2575 |
| 9 | 0836 | 1403 | 2803 | 2018 | 3573 |
| 10 | 0777 | 1430 | 2210 | 1923 | 1953 |
| 11 | 0406 | 1272 | 1502 | 1645 | 1981 |
| 12 | 0480 | 1278 | 2499 | 2029 | 2483 |
| **Total** | **12797** | **20291** | **24545** | **25845** | **32080** |
| **%** | **11.07** | **17.56** | **21.24** | **22.37** | **27.76** |

Table: 09 the data was downloaded on the February 2013 at 7.00 pm from the website of www.niscair.com.

A total number of 115558 visitors in the year of 2012 the highest number of 32080 visitors has 27.76% and the lowest number of 12797 visitors has 11.07%.

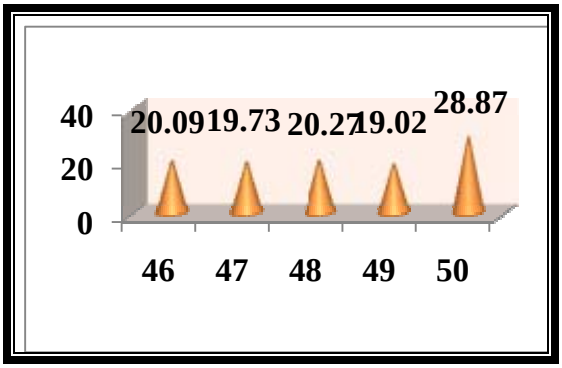


***Figure 2 Distributions of Pages (Volume-wise) & No. of Pages in Each Issue***

**FINDINGS & CONCLUSION:**

The analysis revealed the following conclusions.

- The maximum number of contribution published in November 2012, 50th Volume; 32.
- The minimum contributions are the physics of Elementary particles and fields and Review Article are 4; 0.78%.
- Out of 690 contributions are published in the journal. There are 137 contributions are published in the journal with 19.86%, and the remaining 553 contributions are published in the journal with 80.14%.
- The maximum number of contribution published at two authors with 195; 28.26%.
- The degree of collaboration is 0.92.
- The average pages per paper are 6.52.
- The highest online visitors 32080 are 27.76%.

**REFERENCES**

1. Dakau (B.K); Ramesh (D. B), Publication pattern in scientific and industrial research in India: a bibliometric study. *Annals of Library Science and Documentation*. 42 (1); 1995; p35-38.

2. Pritchard (A), Statistical bibliography or bibliometrics? *Journal of Documentation*. 25 (4); 1969; p348-349.

3. Ratian (Gurjeet Karu), International Journal of Information Dissemination & Technology: Bibliometric Analysis of *Malaysian Journal of Library & Information Science: 2007-2011*; 2 (4); 2012; p307-312.