

# Scientometric Study of the Research Publication on Indian Journal of Pure & Applied Physics

S.Nattar<sup>1</sup>, A.Duraisingam<sup>2</sup> and D. Alex<sup>3</sup>

<sup>1</sup>Librarian, Sri S. Ramasamy Naidu Memorial College, Sattur, Tamil Nadu, India

<sup>2</sup>Librarian, Arul Anandar College, Karumathur. Tamil Nadu, India

<sup>3</sup>Research Scholar, M.S.University, Tirunelveli, Tamil Nadu, India

Email. nattarwinsall@gmail.com, duraisingam65@gmail.com, Antonyalex79@yahoo.com

(Received 25 September 2014; Revised 13 October 2014; Accepted 30 October 2014; Available online 4 November 2014)

**Abstract** -Scientometric analysis of 1481 articles published in the Indian Journal of Pure and Applied Physics during the year January 2001 –December 2010 are taken up to observe the distribution of contributions, authorship pattern, and geographical distribution of contributions. Results indicate that highest numbers of papers have been written by co-authors. The contributions in this journal from India are slightly more than those from the other countries. The growth and popularity of this journal is found to show an upward trend.

**Keywords/Descriptors:** Scientometrics, Distribution of Contributions, Geographical distribution, Indian Journal of Pure and Applied Physics.

## I.INTRODUCTION

‘Scientometrics’ the branch science of science that describes the output traits in terms of organizational research structure, resource inputs and outputs, develops benchmarks to evaluate the quality of information output. Scientometric studies characterize the disciplines using the growth of the pattern and other attributes.

It provides a key opportunity to the researcher to publish their articles with new strategies, innovations, new methods and new ideas. Indian journal of Pure and Applied Physics highly helpful in the field of Atomic and Molecular Physics Electromagnetism Condensed Matter 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.

## II.SOURCE JOURNAL

Indian Journal of Pure and Applied Physics have been selected as the source journal for the present study. The Indian Journal of Pure and Applied Physics is published by National Institute of Science Communication And Information Resources, CSIR New Delhi. The monthly issue of this journal contains Full papers, short notes, rapid

communications and Review Articles. The articles published in this journal cover all areas of research in Nuclear Physics, Atomic and Molecular Physics, Electromagnetism, Optics, Acoustics, Heat Transfer, Classical Mechanics and Fluid Dynamics, Physics of Gases, Plasmas and Electric Discharge, Condensed Matter, Interdisciplinary Physics and Related Areas of Science and Technology.

## III.OBJECTIVES OF THIS STUDY

The following objectives were formulated for the present study:

1. To examine the authorship pattern of the contribution;
2. To indicate geographical distribution of contributions;
3. To find out the research productivity count of the contributions on the basis of geographical distribution both at national and international levels;
4. To observe the number of pages used in different volumes.

## IV.SCOPE OF THIS STUDY

An attempt has been made to analyse the contributions in 36 issues of 3 volumes of the Indian Journal of Pure and Applied Physics in the field of Nuclear Physics, Atomic and Molecular Physics, Electromagnetism, Optics, Acoustics, Heat Transfer, Classical Mechanics and Fluid Dynamics, Physics of Gases, Plasmas and Electric Discharge, and Condensed Matter during the year from January 2001 to December 2010.

## V.METHODOLOGY

The data pertaining to Indian journal of Pure and Applied Physics regarding 1481 contributions made from January 2001 to Dec 2010. The analysis made an authorship, authorship pattern, geographical distribution in national and international wise, citation of publication of Indian journal of Pure and Applied Physics. The authorship pattern has been analysed by using K. Subramaniam’s degree of collaboration in quantitative terms. All the data were subsequently examined, observed, analysed and tabulated for making observations.

## V.I.DATA ANALYSIS

TABLE 1 DISTRIBUTION OF CONTRIBUTIONS

Year	No. of Articles	Percentage
2001	141	9.52
2002	138	9.32
2003	157	10.6
2004	148	9.99
2005	152	10.26
2006	156	10.53
2007	163	11.01
2008	146	9.86
2009	138	9.32
2010	142	9.59
Total	1481	100

Table 1 portrays that out of 1481 contributions, 11 per cent of them were contributed in 2007, 10.6 per cent of them were published in 2003. It is inferred from the table of distribution of contributions from 2001 to 2010 that the level of the percentage of distribution has decreased. A notable attribute of the study is that the year 2007 shows the maximum number of contributions. The highest Publication is in 2007 with 163 publications followed by 157 papers in 2003 and 152 papers in 2005. The lowest publication is 138 papers in 2002 and 2009.

TABLE 2 AUTHORSHIP PATTERN OF CONTRIBUTIONS

No. of Authors	No. of Contributions	Total No. of Authorship	Percentage
Single Author	184	184	12.42
Two Authors	691	1382	46.66
Three Authors	452	1356	30.52
Four Authors	89	356	6.01
Five Authors	31	155	2.1
Six Authors	23	138	1.55
Seven Authors	8	56	0.54
Nine Authors	3	27	0.20
	1481	3654	100

Table 2 explicates the authorship pattern of contributions. Out of 1481 contributors, a single author has contributed 12.42 per cent of the total articles. 46.66 per cent of the contributions were published with two authors, 30.52 per cent of the contributions were contributed by three authors. 6.01 per cent of the contributions were published by four authors, 2.0 per cent of the contributions were published by

five authors, 1.55 per cent of the contributions were published by six authors, 0.54 per cent of the contributions were published by seven authors and 0.20 per cent of the contributions were published by nine authors. A significant note of the study is that the majority of the articles are contributed by co- author.

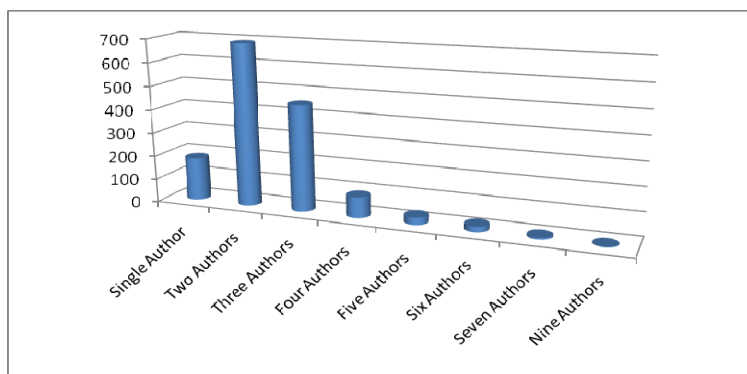


Fig.1 Authorship pattern of contributions

### Degree of collaboration

The formula given by K Subramanyam is useful for determining the degree of collaboration in quantitative

terms. The study followed the same formula which is mathematically put as:

$$C = \frac{NM}{NM + NS}$$

Where C = Degree of Collaboration  
 NM = Number of Multi authored papers  
 NS = Number of single authored papers.

In the present study

$$NM = 1297$$

$$NS = 184$$

Thus C = 0.87

Thus the degree of collaboration in Indian journal pure and applied physics is 0.87 which clearly indicates its dominance upon co-author contribution.

TABLE 3 CONTRIBUTORS (INSTITUTION-WISE)

Year	University	Institution	College	Total
2001	43	86	12	141
2002	48	79	11	138
2003	44	99	14	157
2004	49	81	18	148
2005	62	85	5	152
2006	51	91	14	156
2007	47	101	15	163
2008	64	76	6	146
2009	55	67	16	138
2010	61	72	9	142
	524	837	120	1481

Table 3 depicts the geographical distribution of Contributions. Out of 1481 contributor the maximum numbers of contribution taken Institution level, followed by Institutions and colleges. It is inferred from the above table that Institution-wise contributions were the maximum.

TABLE 4 GEOGRAPHICAL DISTRIBUTION OF CONTRIBUTIONS IN INDIA

Sl. No.	Name of the State	No. of Contributions
1	Uttar Pradesh	489
2	West Bengal	365
3	Rajasthan	322
4	Madhya Pradesh	312
5	Andhra Pradesh	284
6	Tamilnadu	245
7	Karnataka	165
8	Maharashtra	145
9	New Delhi	125
10	Himachal Pradesh	112
11	Jammu & Kashmir	107
12	Assam	89
13	Gujarat	72
14	Orissa	25
15	Kerala	17
16	Punjab	15
17	Bihar	10
17	Chandigarh	6
18	Haryana	5
19	Goa	5
20	Meghalaya	2
20	Tripura	2
21	Pondicherry	2
		2921

TABLE 5 GEOGRAPHICAL DISTRIBUTION OF CONTRIBUTIONS AT INTERNATIONAL LEVEL

Sl.No.	Name of the Country	No. of Contributions
1	India	2921
2	China	212
3	Turkey	139
4	Iran	86
5	Malaysia	65
6	Serbia	59
7	Egypt	45
8	UK	32
9	France	26
10	Bangladesh	21
11	USA	14
12	Korea	12
13	Japan	9
14	Slovenia	8
15	Germany	7
16	Soudi Arabia	5
17	Italy	4
18	Colombia	4
19	Taiwan	3
20	Belgium	3
21	Spain	2
22	Israel	2
23	Taipei	1
24	South Africa	1
25	Ethiopia	1
26	Poland	1
27	Slovak Republic	1
	Total	3684

Table 4 explains that, a study of the 1065 contributions made reveals first position of Uttar Pradesh with 489 articles. Regarding the states like Meghalaya, Pondicherry and Tripura the contribution share was of less percentage. A significant observation of the study is that Uttar Pradesh dominates the number of contributions.

Table 5 shows that 2921 contributions came from India; 212 contributions came from China; 139 contributions came from Turkey; 86 contributions came from Iran and 65 contributions came from Malaysia Countries. However, it is inferred that out of the above mentioned twenty seven countries, India gives priority for research when compared to other countries.

TABLE 6 AVERAGE CITATION PER CONTRIBUTION IN EACH VOLUME

Year	No. of articles	No. of Citations	Average per article
2001	141	2218	15.73
2002	138	2397	17.37
2003	157	2659	16.94
2004	148	2675	18.07
2005	152	3065	20.16
2006	156	3078	19.73
2007	163	2820	17.30
2008	146	2903	19.88
2009	138	2809	20.36
2010	142	2849	20.06
	1481	27473	

Table 6 shows that 120 issues of ten volumes of Indian Journal of pure and applied physics contained 27473 citations. Highest number of citation came from 2009 with 20.36 per cent followed by 2005 with 20.16 percent. The lowest citation is 15.73 percent in 2001.

### VII. FINDINGS

From the observation made in this study, the following points may be inferred:

1. Majority of the contributions in the journal are by a two author's presumably one being a research scholar and the other is his/her guide.

2. The degree of collaboration in Indian Journal of Pure and Applied Physics is 0.87 which clearly indicates its dominance upon co-author contribution.
3. The year 2007 has maximum articles contributed.
4. Among the contributions, the maximum number of contributors is from the Institution.
5. All the contributions are with citations. It is observed that in 2009 with 20.36 per cent are more citation documents.

### VIII. CONCLUSION

The publishing trend totally depends on the productivity of contributors, pattern of contributions and the quality of information. In the year 2007 shows the maximum of contributions made in this journal. A significant note of the study is that the majority of the articles are contributed by co-author and that the Institution – wise contributions were the maximum. In India Uttar Pradesh dominates the number of contributions than any other states. The geographical distributions of international level shows among the 27 countries, India gives priority for research when compared to other countries. A notable attribute of this study is that, this journal really stipulates / induces fruitful research for the researcher. Today, we see that research is done in almost all the branches of knowledge, especially in science and technology.

### REFERENCES

- [1] DUTTA (Bidyarthi) and SEN (B K). Indian Journal of pure and applied mathematics: An analysis. IASLIC Bulletin. 46, 4 (2001) 221-226.
- [2] EGGHE (L). Methodological aspects of bibliometrics. Library Science. 25, (1998) 179-191.
- [3] Lewison, G., and P. Cunningham. 1991. Bibliometric Studies for the
- [4] Evaluation of Trans-National Research, Scientometrics, 21: 223-244.
- [5] Pritchard (A). Statistical Bibliography or bibliometrics? Journal of Documentation 25, 4 (1969) 348-349.
- [6] Pritchard, Allen and Writing, G R, Bibliometrics: a bibliography and index (1874-1959). Wettford: AAIIH Books.
- [7] Persson, O., W. Glänzel, & R. Danell. 2003. Inflationary Bibliometric Values: The Role of Scientific Collaboration and the Need for Relative Indicators in Evaluative Studies. Paper presented at the 9th International Conference on Scientometrics and Informetrics, Beijing.
- [8] Rip, A. 2007. Qualitative Conditions for Scientometrics: The New Challenges, Scientometrics, 38(1): 7-26.