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Title	Status of mathematical publication in Japan
Author(s)	Namiki, Takao
Citation	
Version Type	
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Status of mathematical publication in Japan: SPARC Japan and institutional repositories play an essential role

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1. Introduction

When we use MathSciNet, we can find a number of mathematical journals published in Japan. However, it is uncertain how many different titles of mathematical journals are published and how many articles appeared in them.
We should have been aware of this fact. For example, about 10 titles of major mathematical journals, which are supported by SPARC Japan, IR of Kyoto University Library, and IR of the University of Tokyo Library, account for approximately 5 to 10 percent of articles in certain research fields in the world (Figure 1). Also, we can note from this figure that the number of articles published in Japan is not far behind the number published by Springer and Elsevier. From these facts, it is clear that SPARC Japan and institutional repositories play an important role for mathematical publications in the world.
These major journals contain about 1000 articles each. However, according to MathSciNet, there are over 100 titles of mathematical journals and university bulletins containing less than 200 articles each. Including these titles, contributions of Japanese mathematical publication to the world will achieve more recognition.

2. List of Journals

In this section we show the list of journals and the number of articles which is published in a journal.

7830 (c,IR) Surikaisekikenkyusho Kokyuroku
2753 (c,EUCLID) Proc Japan Acad
2707 (c)Progr Theoret Phys
2395 (c,EUCLID) Proc Japan Acad Ser A Math Sci
2391 (c,EUCLID) J Math Soc Japan
2357 (c,EUCLID) Tohoku Math J
2079 (c,EUCLID) Nagoya Math J
2010 (c,EUCLID) Osaka J Math
1679 (c)J Math Kyoto Univ
1529 (c)J Phys Soc Japan
1486 (c,EUCLID) Publ Res Inst Math Sci
1363 (c)Sugaku
1242 (c,EUCLID) Hiroshima Math J
1082 (c,EPrints)Hokkaido Math J
1028 (c,J-STAGE) Funkcial Ekvac
0972 (c,EUCLID) Kodai Math J
0952 (c,EUCLID) Tokyo J Math
0915 (c)Tsukuba J Math
0898 (c,IR) Math J Okayama Univ
0897 (c)Kodai Math Sem Rep
0771 (c)Internat Econom Rev
0656 (IR) J Fac Sci Univ Tokyo Sect IA Math
0652 (c)Yokohama Math J
0632 (c)J Oper Res Soc Japan
0626 Mem Fac Sci Kyushu Univ Ser A
0608 (c)Questions Answers Gen Topology
0594 (c)Sci Math Jpn
0547 Math Sem Notes Kobe Univ
0498 Japan J Math
0450 (c)J Japan Statist Soc
0428 (c)Progr Theoret Phys Suppl
0380 (c)Japan J Indust Appl Math
0376 (c)Kobe J Math
0345 Proc Imp Acad Tokyo
0315 (c,J-STAGE)Kyushu J Math
0297 (c,IR)J Math Sci Univ Tokyo
0271 Sci Rep Tokyo Kyoiku Daigaku Sect A
0262 (c)Nihonkai Math J
0247 (c)Proc Inst Statist Math
0244 (c,web)SUT J Math
0241 (EUCLID) Osaka Math J
0227 Electron Comm Japan
0219 (c,IR)Natur Sci Rep Ochanomizu Univ
0218 (c)Mem Fac Sci Kochi Univ Ser A Math
0211 (c)Math J Toyama Univ
0211 (c)IPSJ J
0210 (c)Fluid Dynam Res
0206 (IR) J Fac Sci Univ Tokyo Sect I
0198 Electron Commun Japa
0195 Trans Inform Process Soc Japan
0190 Mem Coll Sci Univ Kyoto Ser A Math
0185 Electron Comm Japan Part
0184 (c)Sugaku Expositions
0182 Bull Fac Sci Ibaraki Univ Ser A
0178 Rep Statist Appl Res Un Japan Sci Engrs
0172 J Fac Sci Hokkaido Univ Ser I
0171 J Sci Hiroshima Univ Ser A I Math
0170 J Sci Hiroshima Univ Ser A
0167 Japanese J Fuzzy Theory Systems
0165 J Operations Res Soc Japan
0158 Japan J Appl Math
0147 Math Rep Toyama Univ
0144 Proc Phys Math Soc Japan
0143 (c,IR)Bull Yamagata Univ Natur Sci
0142 Tech Rep Osaka Univ
0140 J Math Tokushima Univ
0138 Ann Inst Statist Math Tokyo
0137 (c)J Fac Sci Shinshu Univ
0133 (c)Interdiscip Inform Sci
0130 Systems Comput Japan
0130 Sugakushi Kenkyu
0128 Bull Fukuoka Univ Ed
0125 J Hokkaido Univ Ed Sect
0120 Sci Rep Niigata Univ Ser A
0118 Bull Nagoya Inst Tech
0116 Mem Fac Engrg Kyoto Univ
0116 Bull Tokyo Gakugei Univ
0110 (c)Sci Rep Kanazawa Univ
0109 Sci Papers College Gen Ed Univ Tokyo
0109 Bull Kyushu Inst Tech Math Natur Sci
0107 (c)Ryukyu Math J
0105 Proc Fac Sci Tokai Univ
0101 (c)Saitama Math J
0101 (c)Ann Japan Assoc Philos Sci

The serials above show that there exists various type of publications in Mathematical Community of Japan. But the next table shows that the total number of articles published in Japan is by no means large.

Year	Japan	Total	Ratio
1940	150	4772	0.0314
1945	52	18101	0.00287
1955	451	66995	0.00673
1965	526	176689	0.00297
1975	956	378491	0.00252
1985	1252	694003	0.00180
1995	1718	1115942	0.00153
2005	1157	1687029	0.00068

We have different results if we investigate for each research field.

3. Big Deal versus Mathematical Community in Japan

By the following figures we can observe the relative positions of our publications compared with Springer and Elsevier in each research fields. In many research field, we can recognize that publications in Japan keep high performance.

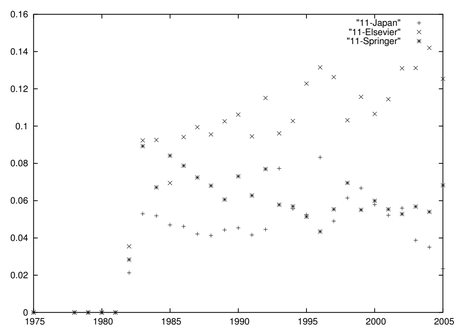

Figure 1: *11: Number Theory (1766/34968)*

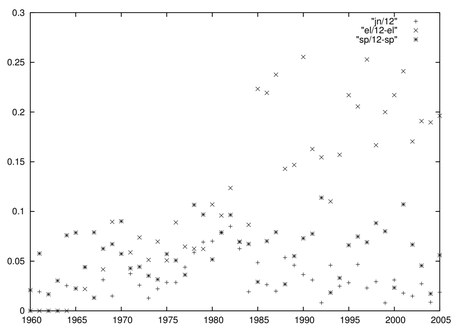

Figure 2: *12: Field theory and polynomials (507/6595)*

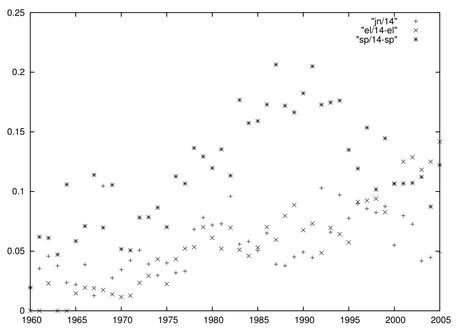

Figure 3: *14: Algebraic Geometry (1916/19744)*

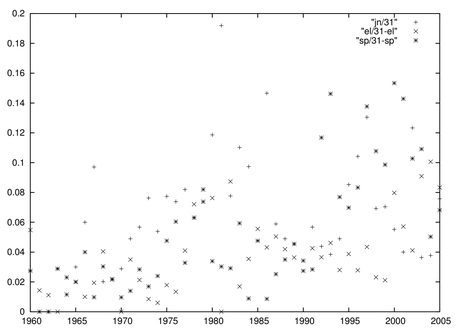

Figure 4: *31: Potential Theory (540/5366)*

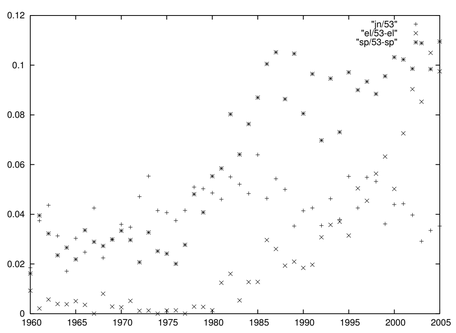

Figure 5: *53: Differential geometry (3210/39080)*

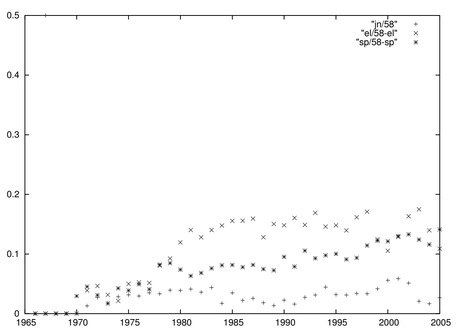

Figure 6: *58: Global analysis, analysis on manifolds (1983/36832)*

4. Conclusion

There was no quantitative investigations about publications related to mathematics in Japan. In this research we found that our publications were kept its performance high even if these are compared with Big Deal.