

Sources of information in the field of electromagnetism and occupational safety: bibliometric and altmetric data

Abstract. The paper presents the results obtained during the searches conducted in the bibliographic-abstracted databases Web of Science, Scopus, BazTech in May 2016. The results obtained by bibliometric indicators were contribution to write about altmetric indicators. During the work search been done in database BazTech, which however, does not provide data on traditional and altmetrics indicators. The time range was from 2005 to 2015. Results are the contribution to discussion about articles, journals and indicators.

Streszczenie. W pracy zaprezentowano wyniki uzyskane podczas wyszukiwań prowadzonych w bazach bibliograficzno-abstraktowych Web of Science, Scopus, BazTech w maju 2016 r. Uzyskane wyniki o wskaźnikach bibliometrycznych były przyczynkiem do przywołania wskaźników altmetrycznych. Podczas prac korzystano także z krajowej bazy BazTech, która jednak nie udostępnia danych o tradycyjnych cytowaniach ani wskaźnikach altmetrycznych. Zakres wyszukiwań dotyczył publikacji z lat 2005-2015. Uzyskane wyniki stanowią wkład do dyskusji na temat artykułów, czasopism i ich wskaźników. (Źródła informacji z zakresu elektromagnetyzmu i BHP – dane bibliometryczne i altmetryczne)

Keywords: citations, Impact Factor, Web of Science, Scopus, altmetrics indicators, Open Access

Słowa kluczowe: cytowania, Impact Factor (IF), Web of Science, Scopus, wskaźniki altmetryczne, Open Access

Introduction

For several years, bibliometric indicators are important for evaluation of scientific achievements. Authors still have questions: which databases indexed publications, how much citations they have, in which journals publishing is the best way to get citations, if that matter if journal is Open Access and recently also the questions about altmetrics indicators what is that and if are equal bibliometric. Altmetric information is possibly to get in Scopus and some publishers shares that on WWW, where article is presented. Web of Science shared information about indicator called usage count. That informs about number of clicks to the full article by tab: "Full text from publisher". Another additional info different than bibliometric indicators brings Scopus i.e.: SJR - SCImago Journal Rank and SNIP - Source Normalized Impact per Paper. Altmetric indicators are discussed and not for everyone deserve attention, in 2011 Gunter Eysenbach said that number of tweets can be prognostic for number of citations.

Bibliographic-abstracted databases

The aim of this study was to analyze information about publications in the field of electromagnetism and occupational safety and health (OSH) indexed and available in database Web of Science Core Collection (WoS CC), Scopus and BazTech. BazTech database is the Polish source identified as domestic. It provides information about publications and optionally full text but not bibliometric or altmetrics indicators. The aim of the analysis was to identify the sources of the above-discussed range, which will provide information, inter alia of indexed publications, citation indexes.

For some time now, bibliometric indicators such as citations, Hirsch index (H index) and Impact Factor (IF) have been required during the parametric evaluation of the publications of staff and institutions. These indicators are different depending on the source. The results are different in every database WoS CC and Scopus. These differences mainly result from the different number of journals that are indexed (approx. 12,000 on WoS CC, approx. 22,000 on Scopus).

As additional information about publications, the results of search provide information about journals, which have an Impact Factor (IF) in WoS CC and which are listed in the Science and Social Science editions of Journal Citation Reports (JCR). The chronological range of available data

depends on the year when IF was calculated first time for the journal. And the journal was covered by the Master Journal List, known in Poland as the Philadelphia List. Journals with IF in the field of electromagnetism and occupational safety were selected during the study.

Table1. Journals: received as result for query *electromagnetics* in WoS CC, IF 2014 / 2015, Open Access, examples

no	Journal title	IF 2014	IF 2015	Open Access
1	PROGRESS IN ELECTROMAGNETIC S RESEARCH-PIER	1,229	1,315	Yes
2	COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING	2,959	3,467	No
3	CMES-COMPUTER MODELING IN ENGINEERING & SCIENCES	1,030	0,841	No
4	INTERNATIONAL JOURNAL OF THERMAL SCIENCES	2,629	2,769	No
5	INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING	2,055	2,100	No

As an alternative to the Thomson Reuters indicators, Elsevier's Scopus provides, e.g.: SCImago Journal Rank (SJR) and Source-Normalized Impact per Paper (SNIP) established in 2010 in the Center for Science and Technology Studies (CSTS) at Leiden University. Moreover, Scopus provides information about altmetric indicators related to scientific communication, i.e., alternative indicators resulting from other activities than traditional citations, namely tweeting, blogging, use of Mendeley and other ways of communications in the Internet.

Altmetric indicators: **Usage:** clicks, downloads, views;

Captures: bookmarks, code forks, favorites, readers, watchers – eg. "My Library"; **Mentions:** blog posts, comments, reviews, Wikipedia links; **Social media:** tweets, likes, shares; **Citations:** PubMed Central, Scopus, CrossRef. All that indicators are registered and accessible in Scopus and on the publishers web sides.

During the search in the field of *electromagnetism* and *occupational safety and health* results gave the following list of examples as journals indexed in WoS CC, Scopus and Journal Citations Report (Thomson Reuters). All that examples publications with high citations has usage count in WoS CC since 2013 that is replacement of

altmetric indicators in Scopus. And more articles with single Polish affiliations has citations but during the searches done before publications with international affiliations have more citations.

Table 2. Results for a query *electromagnetics* and affiliation: Poland in WoS CC, publications with high number of citations, additional information about references / how many references were cited already; Usage Count in WoS CC and country of co-authors.

No	Article (Year of publication)	Journal	Cited in WoS CC	References / References citations	Usage Count in WoS CC	Affiliation
1	A memory efficient and fast sparse matrix vector product on a gpu (2011)	PROGRESS IN ELECTROMAGNETICS RESEARCH-PIER	29	31 / 31 cited	Last 180 Days: 0 Since 2013: 15	Poland
2	Finite element matrix generation on a gpu (2012)	PROGRESS IN ELECTROMAGNETICS RESEARCH-PIER	25	27 / 27 cited	Last 180 Days: 1 Since 2013: 18	Poland
3	Fourier series expansion in a non-orthogonal system of coordinates for the simulation of 3D alternating current borehole resistivity measurements (2008)	COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING	19	33 / 33 cited	Last 180 Days: 0 Since 2013: 6	Poland USA
4	Efficient Cohomology Computation for Electromagnetic Modeling (2010)	CMES-COMPUTER MODELING IN ENGINEERING & SCIENCES	17	43 / 43 cited	Last 180 Days: 0 Since 2013: 1	Poland
5	Experimental validation of the coupled fluid flow, heat transfer and electromagnetic numerical model of the medium-power dry-type electrical transformer (2008)	INTERNATIONAL JOURNAL OF THERMAL SCIENCES	13	36 / 36 cited	Last 180 Days: 0 Since 2013: 17	Poland

Table 3 Journals indexed in the WoS CC, found in the results for query for *electromagnetics* which appeared at least 2 articles, affiliation: Poland, 2005-2015.

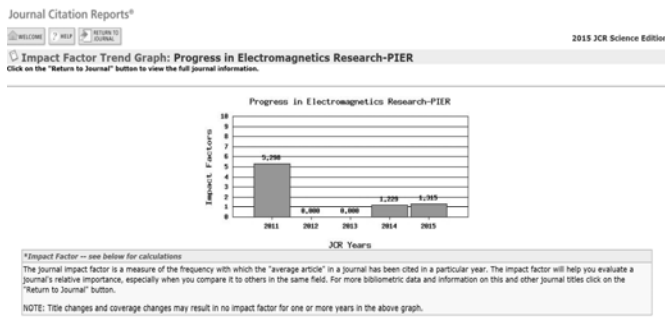
Lp.	Journal	Articles Years	Citations
1	COMPEL-THE INTERNATIONAL JOURNAL FOR COMPUTATION AND MATHEMATICS IN ELECTRICAL AND ELECTRONIC ENGINEERING	2012	3
		2010	2
2	COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING	2013	4
		2011	4
		2009	5
		2008	19
		2005	7
3	IEEE ANTENNAS AND WIRELESS PROPAGATION LETTERS	2013	7
		2012	11
		2012	11
		2011	13
4	IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION	2013	15
		2008	6
		2014	4
5	IEEE TRANSACTIONS ON MAGNETICS	2010	2
		2006	2
		2014	3
6	IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES	2012	3
		2012	26
7	PROGRESS IN ELECTROMAGNETICS RESEARCH-PIER	2012	26
		2011	30

In that result more publications two, three years back have more citations than from the last year, so mostly article needs time to be cited.

Table 4. Journals indexed in Scopus, found in the results for query for *occupational safety and health*, affiliation: Poland, number of indexed and cited publications, citations, Open Access, 2005-2015.

No	Journal	Indexed / cited publications	Citations in Scopus	Open Access
1	American Journal of Infection Control (2006)	9 / 7	144	No
2	Safety Science (2010)	16 / 13	199	Hybrid
3	Annals of Agricultural and Environmental Medicine (2007)	645 / 482	3 396	Yes
4	European Respiratory Journal (2014)	36 / 36	1 204	No
5	Reproductive Toxicology (2013)	34 / 29	371	No

That results shows that OA journal and hybrid ones got high rate of citations in Scopus. Almost all results of search gave more results in Scopus than in WoS CC and what is related publications in Scopus have more citations than in WoS CC....



2015 Impact Factor
 Cites in 2015 to articles published in: 2014 = 208 Number of articles published in: 2014 = 133
 2015 = 531
 Sum: 739
 Calculation: Cites to recent articles 739 ÷ 1,315
 Number of recent articles 562

Fig. 1. View from JCR database with information about *Progress in Electromagnetics Research-PIER*, e.g.: IF journals from 2011 and 2014, 2015 years (accessed 28 September 2016).

BazTech is a bibliographic abstracted database with records since 1998. The base includes articles from 654 Polish journals in the field of technical sciences, science and environmental protection. Since 2006, the bibliographies attachments are added to the records and some allows access to full text. It enables simple and complex searches but does not provide information on citations or altmetric indicators as other.

BazTech offers:

- provide a complete and free source of information about Polish publications in journals in the field of broad issues of technical sciences,

- promote the achievements of Polish scientific thought and technology,
- supporting the movement of open science by making available the full text of the publication registered in the database,
- support interlibrary loan

63 results for *electromagnetics* were found in BazTech for time range 2005-2015, compare to WoS CC: 46 for Poland (35 were cited), for all countries 2 189; compare to Scopus 57 for Poland (46 were cited), for all countries 3 761 results

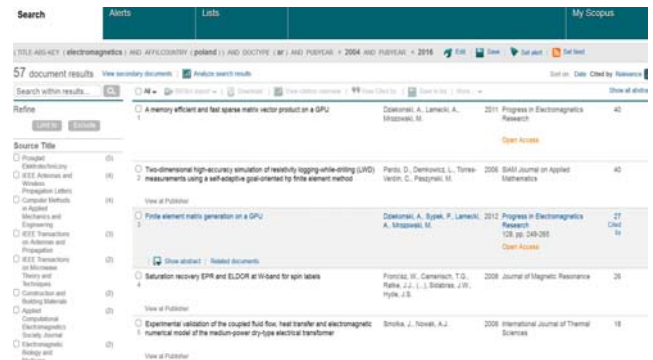


Fig. 2. Fragment of the results page for query about *electromagnetics* in Scopus, affiliation: Poland, date range 2005-2015 (accessed 10 May 2016)

Table 5. Journals indexed in the WoS CC, found in the results for query for *occupational safety and health*, altmetrics indicators, affiliation of co-authors.

N o	Article (Year)	Journal	Cited in Scopus	References / references citations	Altmetrics indicator	Affiliation
1	Do N95 respirators provide 95% protection level against airborne viruses, and how adequate are surgical masks? (2010)	American Journal of Infection Control	82	31 / 29 cited	37 Mendeley 1 Tweet	United States Poland
2	Nanotechnologies, engineered nanomaterials and occupational health and safety - A review (2010)	Safety Science	60	55 / 47 cited	72 Mendeley	Finland Netherlands United Kingdom Germany Poland
3	Levels of fungi and mycotoxins in the samples of grain and grain dust collected from five various cereal crops in Eastern Poland (2007)	Annals of Agricultural and Environmental Medicine	37	62 / 55 cited	7 Mendeley	Poland
4	Specific inhalation challenge in the diagnosis of occupational asthma: Consensus statement (2014)	European Respiratory Journal	30	43 / 43 cited	6 Mendeley 17 Twitter 1 Post on GooglePlus	Poland
5	Effects of lung exposure to carbon nanotubes on female fertility and pregnancy. A study in mice. (2013)	Reproductive Toxicology	18	36 / 36 cited	20 Mendeley	Poland

Below in the table 6 there are open access journals indexed in WoS CC and Scopus, which were published by authors with Polish affiliation - along with information about the IF and charges for publications. Open Access journals were find as a result for query about *electromagnetics*.

Table6. Open Access Journals in WoS CC / Scopus obtained for a query: *electromagnetics*, affiliation: Poland, (accessed 10 May 2016), Categories in WoS CC and Subject area & SJR &SNIP & in Scopus; cost of publication

OA Journal (country, Impact Factor /IF/)	Categories in WoS CC	Subject Area in Scopus	SJR SCImago Journal Rank	SNIP Source Normalized Impact per Pape	Cost of publication
Progress in Electromagnetics Research	ENGINEERING, ELECTRICAL& ELECTRONIC PHYSICS, APPLIED	Engineering, Physics and Astronomy	0,682	1,240	200 USD 1 page

(USA) (IF= 1,315) WoS CC / Scopus	TELECOMMUNICATIONS				
Microwave Review (Serbia) Scopus	Not indexed in WoS CC	Engineering, Social Sciences	0,176	0,225	free
Annales Geophysicae (Germany) (IF= 1,731) WoS CC / Scopus	ASTRONOMY& ASTROPHYSICS GEOSCIENCES, MULTIDISCIPLINARY METEOROLOGY& ATMOSPHERIC SCIENCES	Earth and Planetary Sciences, Physics and Astronomy	1,105	0,926	50 USD page
Radioengineering (Czech/Slovak) (IF=0,590) WoS CC / Scopus	ENGINEERING, ELECTRICAL& ELECTRONIC	Engineering	0,309	0,810	40 EUR=1 page 200 EUR = 1 color page

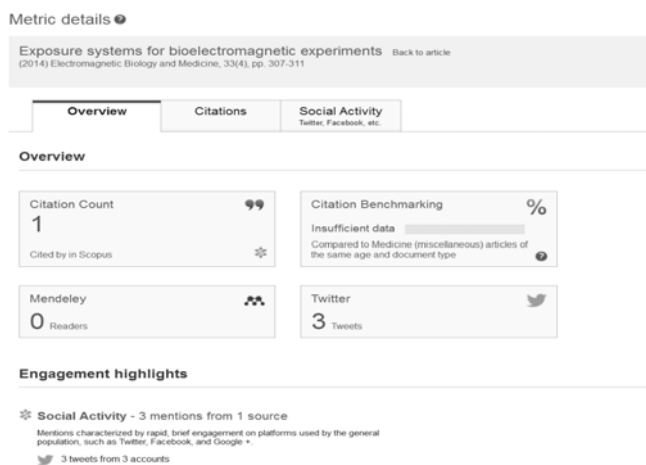


Fig. 3 Altmetric indicators listed in Scopus for article *Exposure systems for bioelectromagnetic experiments*: Mendeley = 0, Twitter = 3 (accessed: 10 May 2016)

Summary

The information collected in bibliographic-abstracts databases provide access to data on publications, citations of journals (e.g.: IF, index H). Sophisticated and analyzed data (such as OA journals, the publishing fee show journals with high rates of citations in WoS CC and Scopus can help authors to choose the journals for publishing.

Each query gave different result in each database, specially BazTech contains much less indexed journals than WoS CC and Scopus.

Even basic search can give more additional informations than citation report only, e.g. most cited journals, OA cited publications, over 70% of references were cited – already cited references are more likely to be cited; over 50% results for queries were cited. Other ways of communications can help in increasing the number of citations. Altmetric indicators can be more important for measuring influence the articles in the future. That informal form of communication like tweets, Mendeley reads or

others may be the next step to increase the rate of citations.

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