

Electromagnetics & Occupational Safety and Health (OSH) in bibliographic databases – qualitative-quantitative analysis

Abstract. This paper reports on research conducted in March 2014 on two databases: the Web of Science and Scopus. These bibliographic databases provide information on publications, citations and other metrics. This research focused mainly on publications from Central and Eastern Europe, indexed in these databases from 2000 to 2013. The same queries produced different results on the number of publications and two bibliometric factors (citations and the Hirsch index), which were then compared and analysed. The results illustrate the differences between the databases and contribute to the discussion on how the number of citations is influenced by the ways of searching, the impact of Open Access and multiple affiliations.

Streszczenie. Artykuł opisuje badania prowadzone z wykorzystaniem baz: Web of Science i Scopus- dostarczają one informacji na temat indeksowanych publikacji i danych bibliometrycznych, w tym cytowań. Wyszukiwania koncentrowały się na publikacjach z krajów Europy Środkowej i Wschodniej z lat 2000-2013. Wpisując te same zapytania otrzymano różne wyniki dotyczące liczby publikacji i wskaźników bibliometrycznych: liczby cytowań i indeks Hirscha. Zostały one przeanalizowane i porównane także w aspekcie afiliacji autorów publikacji. Wyniki pokazują wiele różnic i mogą być przyczynkiem do dyskusji na temat wpływu na cytowania czynników m.in. takich jak afiliacja, open Access. **Elektromagnetyzm & bezpieczeństwo i higiena pracy (BHP) w bibliograficznych bazach danych – analiza jakościowo-ilościowa.**

Keywords: bibliographic databases, Web of Science, Scopus, Hirsch index, affiliation, citations, open access.

Słowa kluczowe: bazy bibliograficzne, Web of Science, Scopus, indeks Hirscha, afiliacja, cytowania, open access.

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Introduction

The author conducted research in March 2014 using two widely known bibliographical databases, i.e., the Web of Science (WoS) and Scopus; both are multidisciplinary, they have similar construction and fields for searching. Names of the fields and a list of indexed journals (articles) and proceedings are different. In popular perception, WoS is perceived as American (Thomson Reuters) and Scopus as European (Elsevier). Both index different types of documents, such as articles, proceedings, reviews, biographical items, letters, meeting abstracts, editorial materials, corrections and reprints. Most of these types were articles and proceedings, sometimes in one record marked as both types. In the results, articles and proceedings were prevalent. In 2010, WoS indexed articles from over 12,000 current periodicals. They contained about 50 million records and 800 million citations. The construction of WoS platform (prior to 2014, the Web of Knowledge) is different than WoS (Web of Science™ Core Collection in the January 2014 edition). The author conducted all of his general searches on WoS. WoS enables access to another database, JCR, which comprises an assessment of bibliometric information on scientific journals, and provides information about journals' Impact Factor (IF). Furthermore, as additional information, the author presented information about the Hirsch index (H-index), which was included in tables for each country. Scopus is a bibliographic database containing abstracts and citations of academic journal articles. It covers nearly 21,000 titles from over 5,000 publishers, of which 20,000 are peer-reviewed journals in the scientific, technical, medical, and social sciences.

Research

Both databases provide the possibility to acquire all kinds of information about the publication, author, affiliation, types of documents and many more. For that presentation, the author did his research using the "Basic search" option in WoS and "Document search" in Scopus. In WoS, queries were typed in the „Topic” field, the following fields were retrieved using this specific field (Title, Abstract, Author Keywords, Keywords Plus). In Scopus, the search was done in the field "TITLE-ABS-KEY" (Article Title, Abstract,

Keywords). It is similar to the "Topic" field in WoS. Territorial scope included Central European Countries (CE) together with other countries from Eastern Europe. Only the first table included results of searching done for all countries without being restricted to CE countries. To make the comparison more complete, the results for all countries and the CE region were included. The range of dates was the same for all queries: from January 2000 to December 2013. That period made it possible to find records spanning a considerable time. In shorter spans of time, the differences between results were too small for comparisons. During research, the time factor was very important because each database was charged with data once per week. Therefore, after a few weeks, the search results could be different.

In both databases, the same queries were used. They contained the following terms: applied electromagnetics, bioelectromagnetics, electromagnetics, electromagnetics & hazard and occupational safety and health. Queries were typed without quotation marks (in alphabetical order). The results included all types of documents without narrowing them down to articles or proceedings.

Table 1 presents differences between results obtained from WoS and Scopus according to the query as well as differences between the same terms typed in different fields in Scopus. Moreover, the results were different when typing queries in different fields, which was possible in Scopus. Therefore, the choice of a field affected the final results.

Table 1. Results obtained for the same queries in **Web of Science** (field: Topic) and **Scopus** (fields: All and TITLE-ABS-KEY), without date and territorial narrowing (All countries)

Database Query	WoS (Topic)	Scopus (All)	Scopus (TITLE-ABS- KEY)
Applied electromagnetics	645	41,712	960
Bioelectromagnetics	610	11,137	318
Electromagnetics	3,168	75,850	6,649
Electromagnetics AND hazard	10	954	36
Occupational safety and health	4,899	84,207	18,165
"occupational safety and health"	1,645	16,037	4,616

Table 1 presents differences between results obtained from WoS and Scopus according to the query. At first glance, occupational safety and health looked the same as "occupational safety and health", but when putting the queries in quotes, we can see different results. In this case, records containing the exact phrase as well as words appearing in the title, abstract etc. were found/searched. The author noticed different results, which were correlated with the construction of a query.

Table 2. Results obtained from **Web of Science** – the same queries; field: Topic

Country	Applied electromagnetics	Bioelectromagnetics	Electromagnetics	Electromagnetics and hazard	Occupational safety and health
Bosnia Herceg	0	0	0	0	5
Bulgaria	1	0	5	0	3
Byelarus	0	0	2	0	0
Croatia	1	1	10	0	14
Czech Republic	4	1	20	0	6
Estonia	0	1	1	0	13
Hungary	1	13	6	0	6
Latvia	0	1	0	0	2
Lithuania	0	0	1	0	12
Macedonia	0	0	4	0	1
Moldova	0	0	0	0	1
Poland	14	14	61	2	71
Romania	0	14	14	2	35
Serbia	5	1	10	0	9
Slovakia	1	3	1	0	2
Slovenia	1	6	7	0	8
Ukraine	3	2	24	0	3

Table 3. Results obtained from Scopus (the same queries; field: TITLE-ABS-KEY)

	Applied electromagnetics	Bioelectromagnetics	Electromagnetics	Occupational safety and health	Electromagnetics and hazard
Bosnia Herceg	0	0	0	6	0
Bulgaria	3	0	14	18	0
Belarus	0	0	5	0	0
Croatia	2	1	19	55	1
Czech Republic	12	0	49	36	0
Estonia	0	1	1	15	0
Hungary	2	5	11	15	0
Latvia	0	0	4	6	0
Lithuania	1	2	0	18	0
Macedonia	0	0	5	1	0
Moldova	0	0	1	2	0
Poland	21	21	110	186	2
Romania	2	2	25	59	0
Serbia	2	0	12	17	0
Slovakia	2	0	6	15	0
Slovenia	2	2	14	19	0
Ukraine	3	5	35	3	0

The 2014 edition of WoS makes it possible to search publications in respect of Open Access (OA) indexed publications. The question is if WoS verifies if a publication

is or is not OA. The results show the exact outcome from that database.

Table 4. Results obtained from Web of Science (query: occupational safety and health: in field Topic with Open Access (OA) aspects)

Country	Indexed publications	OA publications	Sum of the times cited OA publications	Not OA publications
Bosnia Herceg	5	2	8	3
Bulgaria	3	0	0	3
Byelarus	0	0	0	0
Croatia	14	3	8	11
Czech Republic	6	2	3	4
Estonia	13	1	2	12
Hungary	6	0	0	6
Latvia	2	0	0	2
Lithuania	12	0	0	12
Macedonia	1	0	0	1
Moldovia	1	0	0	1
Poland	71	8	42	63
Romania	35	3	6	32
Serbia	9	5	9	4
Slovakia	2	0	0	2
Slovenia	8	5	19	3
Ukraine	3	1	0	2

Table 4 presents correlation between OA and not OA publications, a sum of citations of all types of publications, OA and not OA. These results can contribute to the discussion about correlations between the number of citations and OA. Since January 2014, the new edition of WoS makes it possible to find information if a publication is OA.

Table 5. Results obtained from Web of Science and Scopus query: occupational safety and health (citations and H-index are given)

country	Web of Science				Scopus			
	Sum of all indexed publications	Sum of cited publications	Sum of the times cited	H-index	Sum of all indexed publications	Sum of cited publications	Total citations	H-index
Bosnia Herceg*	5	3	9	1	6	5	51	2
Bulgaria	3	3	3	1	18	8	162	4
Belarus/Belarus**	0	0	0	0	0	0	0	0
Croatia	14	7	43	5	55	27	165	8
Czech Republic	6	4	51	3	36	16	136	4
Estonia	13	6	24	2	15	9	31	2
Hungary	6	5	167	4	15	11	256	6
Latvia	2	1	2	1	6	0	0	0
Lithuania	12	7	40	2	18	10	101	4
Macedonia	1	0	0	0	1	1	1	1
Moldovia/Moldova	1	0	0	0	2	1	39	1
Poland	71	33	206	6	186	97	671	12
Romania	35	10	20	3	59	12	32	3
Serbia	9	4	10	2	17	9	215	5
Slovakia	2	0	0	0	15	4	6	2
Slovenia	8	4	22	2	19	10	121	5
Ukraine	3	0	0	0	3	1	6	1

* It is very important to type the name of a country in the field: "address" (affiliation) in WoS, e.g., Bosnia Hercegovina gets different results than in Scopus because of different occurrence. In WoS, a query formulated in the address field: "Bosnia and Hercegovina" produces fewer answers than "Bosnia Herceg". In Scopus, for a thus formulated question in the "affiliation country"

field, there were no answers. This is because the country was typed as "Bosnia and Herzegovina" in Scopus. Another similar example concerns Belarus** (in WoS)/Belarus (in Scopus). Moldova is another example (in WoS 1 result, in Scopus 0 results) but the Republic of Moldova produces 0 results in WoS, 1 result in Scopus but as Moldova it produces 2 results in Scopus.

Table 5 shows differences between the results from WoS and Scopus concerning citations and their relations to the H-index. The index is based on the set of a scientist's most cited papers and the number of citations that they have received in other publications. That index can also be used to measure the productivity and impact of an author (scientist), a group of authors (scientists), subjects, universities and other affiliated institutions, and scholarly journals.

Table 6 presents information about the relationship between citations and an author's affiliation. In some examples, like Hungary, 2 publications were cited 157 times. That as well can be a point in discussion if international affiliation helps to increase the number of citations.

Table 6. Result for a query: occupational safety and health in Web of Science concerning aspects of citations (cited publications, times cited, H-index) and affiliations of authors of publications (national and international)

country	Sum of publications	Sum of cited publications	Sum of the times cited	H-index	Sum of publications with National Affiliation	Sum of citations of publications with National Affiliation	Sum of publications with International Affiliation	Sum of citations of publications with International Affiliation
Bosnia Herceg	5	3	9	1	2	1	3	8
Bulgaria	3	3	3	1	3	3	0	0
Byelarus	0	0	0	0	0	0	0	0
Croatia	14	7	43	5	7	18	7	25
Czech Republic	6	4	51	3	5	48	1	3
Estonia	13	6	24	2	11	22	1	2
Hungary	6	5	167	4	4	10	2	157
Latvia	2	1	2	1	1	0	1	2
Lithuania	12	7	40	2	11	38	1	2
Macedonia	1	0	0	0	1	0	0	0
Moldovia	1	0	0	0	1	0	0	0
Poland	71	33	206	6	60	85	11	121
Romania	35	10	20	3	32	12	3	8
Serbia	9	4	10	2	5	7	4	3
Slovakia	2	0	0	0	2	0	0	0
Slovenia	8	4	24	2	7	24	1	0
Ukraine	3	0	0	0	2	0	1	0

The number of indexed publications (Table 5): occupational safety and health was higher in Scopus than in WoS for 14 countries (Bosnia Hercegovina, Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Serbia, Slovakia, Slovenia) and equal for 3 countries (Byelarus, Macedonia, Ukraine).

Conclusions

Results from both databases depend on the number of indexed titles of journals, proceedings and other documents. A List of indexed journals in WoS can be changed and ThomsonReuters can withdraw indexed titles from WoS as it was done in spring 2013 with *Przegląd Elektrotechniczny (Electrical Review)*. Other publishers should keep this information in mind. Some journals are indexed either in the WoS or in Scopus, other ones in both. Some journals are perceived as national, other ones as international; however, that was not the focus of this analysis. The results of my research show that databases are a source of different information, which can be extracted from both databases. It is crucial to remember about different names of fields in both cases. The presented issues have not been exhausted, and the ability to use data in bibliographic databases can be the basis for further analyses.

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