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Some Methodological Aspects of Selection Serials to Be Included in the Information Environment for Researchers in a Technical or Natural Science (by Example of Optoelectronics and Optical Systems)

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Some methodological aspects of selection serials to be included in the information environment for researchers in a technical or natural science (by example of optoelectronics and optical systems)

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Abstract

A comprehensive citation analysis-based methodology for selecting the world scientific serials to be included in information environment for researchers in a specific natural or technical science is featured. The case study was fulfilled for serials to be included in information environment for researchers in optoelectronics and optical systems (OOS) with the use of Journal Citation Reports (JCR) data. The indices taken for serials evaluation were: total citedness of a serial in the selected journals specialized in OOS; the "discipline impact factor" (Hirst 1978) i.e. the impact factor which numerator is the magnitude of a serial citedness not by all the JCR-indexed journals, but by the ones specialized in OOS, the denominator being the number of papers in a cited serial; the magnitude of total citedness of the journals specialized in OOS in a serial under evaluation; the "discipline susceptibility factor" of a serial (Lazarev and Skalaban 2016; Lazarev et al. 2017), i.e. the number of citations to the mentioned specialized journals made in a serial being evaluated divided by the number of papers in a citing serial. The citation window is one year, the publication window is "5+1" years (i.e. 5 previous years plus the year of citing). With the application of the outlined methodology, the selection of serials believed to be necessary to implement research in OOS has been accomplished, and after application of threshold values, merging and elimination some of the data, the list of 538 serials has been determined. The second pair of indices reflects the susceptibility of the serials being evaluated to the research field represented by cited specialized journals.

Keywords: journals, periodicals, serials (serial publications), citation analysis, discipline impact factor, discipline susceptibility factor, bibliometric evaluation, optoelectronics, optical systems

INTRODUCTION

Bibliometric evaluation of scientific serials is often implemented in order to select the journal to submit a paper to, or to amend a journal (or other serial publication) itself, or to identify different trends in a research field represented by a chosen journal (or other serial). Less popular nowadays is bibliometric evaluation of serials to improve library services. Also it seems more popular now to compare specialized journals that represent one and the same particular research field rather than to study the ability of serials to meet the needs of specialists in one particular subject field, *regardless of the different specialization of serials*. One of the reasons might be the availability of ready-made indicators fit for comparison of specifically the journals specialized in one and the same field. "That it is an easy (and lazy) way to work", Prof. Rémi Barré (2017) stated.

However, there is a "real distinction between the literature *of* a field and the literature *used* by research workers in that discipline" (Garfield 1982). The latter ought to be evaluated as well – but there is hardly any *ready-made* indicator fit for the assessment of the literature *used* by research workers *in a specific discipline*. (The impact factor and its numerous alternatives reflect the use of a journal in technical and natural sciences *in toto*.)

As Lazarev (1998) stated, possible reasons for the decline of the interest to application of bibliometrics for perfection of library services of researchers specialized in a *given* field on the basis of selection of periodicals from *other* fields were on-line access to powerful databases and electronic resources. Nowadays libraries mostly buy

access to huge databases (packages) and do not bother to determine the concrete necessary journals and other serials. Publishers set up prices so that it is much cheaper to buy the whole package than to buy separate journals. And as bibliometric evaluation and selection of non-profile serials to be used by researchers *in a specific discipline* was usually performed exactly in order to select serials for the specialized library stock, there seemed to be no more need in bibliometric evaluation of the non-profile serials value for researchers in a specific discipline (Lazarev 1998).

However, the following question could arise: "*Which* databases (packages) ought to be purchased? The answer might seem easy to a librarian who lives in a country where a regular *sufficient* financial support of university and research libraries is practiced. But in case of restricted, meager financing for database subscriptions, we are to spend our small money for sure. The point is we need to choose exactly the databases ("subscription packages") *with the best coverage of the relevant serials*, the databases ("subscription packages") that optimally meet *both* the requirements of containing more useful periodicals and of being cheapest to be purchased. As many as possible relevant periodicals ought to be accessed via databases (packages) at the lowest financial cost. In order to arrange this, one is to check each "subscription package" for the presence of maximum number of necessary serials. In its turn, in order to fulfill the latter, one is to know concretely *which* periodicals are needed! And therefore, one is to start the procedure that is very much similar to the one that was practiced in the past for the selection periodicals immediately for acquisition to the library stock! (And as for the Open Access journals, thought they *are* available, they *ought to be identified* as well!)

So, various databases, services of publishing houses and providers, "subscription packages", etc. which are to be used by librarians to create the comfortable information environment for researchers should be evaluated by the representation of serials, the most valuable for the researchers in the specific field. (It is meaningless to evaluate the serials by their productivity, as productivity of serials is determined according to their being reflected in specialized databases, while we are searching exactly for an informed choice of right databases.)

The above use the world "valuable" was not occasional: we do consider it appropriate to evaluate serials in accordance with their *value*, considering the value as a property of an object that is determined by its practical use in various areas of purposeful human activity in order to achieve a specific goal and, correspondingly, considering the value of a serial as a property determined by its practical use in a professional scientific activity of representatives of a certain research domain to achieve their professional goals. This definition is based on the definition of value as the "property of information, determined by its fitness for practical use in various spheres of human activity to achieve a certain goal" (Dictionary... 1975); the replacement of the "*fitness* for practical use" by the "practical use" *itself* was caused by the fact that *a priori* value judgments about this or that scientific information are most doubtful even if the most authoritative scientists are involved as experts (Mikhailov et al. 1976). In general, *a priori* judgments (expert evaluation, peer reviewing etc.) reflect not value, but *quality* – just according to the definitions of this property (Lazarev 1997, 2017, 2018).

A reliable indicator of the use of scientific documents and their collections is the magnitude of their total citedness (e.g., van Raan 1998; Wouters 1999; Glazer and Laudel 2007) – a statement until recently questioned quite rarely.

However, some researchers believe that the use of scientific documents is reflected not in documents citedness, but already in the fact of the documents being read; they even declare that "the use arises when a user makes out a request for services related to a particular scientific resource or to a specific information agency" (Kurtz and Bollen 2010). However, such indicators are indicative only of the client's documented *intention* to use the requested documents in the future (Lazarev 1997, 2017). Some people also believe that the use of *altmetrics* may be the best way for evaluation the documents use. However, the "altmetric" counts of downloads or of views of documents does not principally differ from the indices of reading activity of library users... Also the possibility of taking Internet bookmarks, discussions, comments, and recommendations into account is being discussed (Mazov and Gureev 2015); however, in fact, bookmarks are the least obvious indicator of only the *possible* use of the documents in an *indefinite* future, while recommendations only testify to careful and thorough reading of the material without relation to the execution of a particular work (in contrast with what it is reflected in citations). As for discussions and comments, they are in essence nothing but expert evaluation that can be acceptable for assessing the *quality*

of the document but not its use. One can, of course, play with words, and call comments "underdeveloped citations"; however, the *citing document itself is missing* in this case, that is, the concrete document, which was supposed to be *created with the use of the cited document*. So, comments do not reflect use in concrete research work (Lazarev et al. 2017).

The objective of the study was to develop the list of journals and other serials to be used by optoelectronics and optical systems researchers in order to choose hereinafter the optimal combination of opportunities of access to them or to the most of them by the users of the Scientific Library of the Belarusian National Technical University. Naturally, the distribution of the serials according to the publishers was also studied so to explore the possibilities of the use of publishers' "subscription packages" for such an access. However, the present paper is limitedly concentrated around the developing the list of serials and the peculiarities of methods used for this purpose.

BIBLIOMETRIC (SCIENTOMETRIC) ANALYSIS OF DOCUMENTARY INFORMATION FLOWS IN OPTICS

Some papers devoted to bibliometric (scientometric) analysis of documentary information flows in optics are known (Kolpakova et al. 2002; Kolpakova et al. 2004; Takeda et al. 2009; Kazanskiy 2017; Skalaban et al. 2017). Serials are studied *inter alia* in two of them: the paper by Kolpakova et al. (2004) lists 20 most productive journals, the paper by Takeda et al. (2009) presents characteristics of top 25 journals of the studied citation network consisting of 281,404 individual papers. One more paper (Kazanskiy 2017) deals *exclusively* with journals in optics, and it presents the results of a comparative study of 8 specialized journals. This paper is a typical example of the use of ready-made indicators fit for comparison of journals specialized in one and the same area. We do not know any research that would be fulfilled to develop an extensive list of serials specialized in various fields to be involved in the information service of the researchers in optoelectronics and optical systems.

Two of the authors of this paper participated in the study that has demonstrated that the papers related to the "Optics" subject category (according to the Web of Science categories) published by the employees of the Belarusian National Technical University in 2011-2015 had the magnitude of normalized citedness 1.25 higher than the average world's one (Skalaban et al. 2017).

METHODOLOGY

In general, the present study was performed using citation analysis as follows. Using Journal Citation Reports (JCR; *Citing Journal Data* section), we selected journals and other serials that were most heavily cited by several selected specialized journals in optoelectronics and optical systems in 2015[1] (i.e., the citation window was equal to one year). Also, we selected serials according to the value of their "discipline impact factor", i.e. the indicator somewhat similar to the well-known impact factor, the numerator of which, however, contains the value of the citedness not in all journals indexed by the JCR but only in some *selected specialized ones* (Hirst 1978); as for the number of citable items (papers plus reviews) which is its denominator, it was determined from the data of the Journal Citation Reports (Key Indicators). The examples of such an approach could be seen in the papers by Lazarev (1983) and Kushkowski et al. (1998), in which the journals were also selected simultaneously by the value of their total citedness and of the "discipline impact factor". In both cases, the publication window for the final selection was chosen to be "5+1" years, i.e. 2010-2014 plus 2015, i.e. the year in which the references were taken into account. The "plus one year" choice was grounded by the wish to include the most current citations into account. The choice was made with the understanding that the number of citations to the publications of the current year cannot be representative, but this applies *equally to all cited journals and other serials*. And as for the preceding 5 years, according to Price (1970), citations to the preceding 5-year period over the next few years have a much greater impact on the dynamics of citing than the natural growth of literature or its normal aging, so they are of utmost importance. We believe that 5-year aggregate of citations fairly comprehensively reflects already formed (but still current) trends.

[1] The practical study was fulfilled *before* the more recent data became available in JCR.

Also, it ought to be stated that the total number of references given by the citing journals to all citable items of the cited journal reflects the value of the *whole* cited journal for the discipline presented by the citing journals, whereas the magnitude of the "discipline impact factor" of the cited journal reflects the value of an *average article* from the cited journal for the discipline presented by the citing journals.

As the "discipline impact factor" is not a very popular indicator nowadays, we wish to clarify our reasons of its use in the study. We believe that, in order to organize a sufficient information service, it is much more important to know the level of use of a certain journal or other serial *not by all the journals representing technical and natural sciences* (as it is reflected in the classical Garfield impact factor), but *by those that are specialized in that particular discipline or a field of research* which is going to receive a scientific information service. After all, the information service of specialists in a particular research field is the goal of a larger number of libraries than the service of the all the natural and technical sciences "in general".

Five specialized journals were selected as citing source journals, viz. "Nature Photonics" (England, Nature Publishing Group, ISSN: 1749; impact factor is 31.176), "Applied Optics" (USA, Optical Soc. Amer., ISSN: 1559-128X, impact factor is 1.598); "Optical Materials" (Netherlands, Elsevier Science Bv, ISSN: 0925-3467; impact factor is 2.183); "Journal of Optoelectronics and Advanced Materials" (Romania, Natl. Inst. Optoelectronics, ISSN: 1454-4164; impact factor is 0.383) and "Optoelectronics and Advanced Materials-Rapid Communications" (Romania, Natl. Inst. Optoelectronics, ISSN: 1842-6573; impact factor is 0.412). Here and below writing of the titles of serials, publishers and countries correspond to the ones practiced in JCR. The selection took into account the description of the journal subject fields: first, in accordance to the ULRICHSWEB™ database, and then in accordance to the web sites or web pages of the journals themselves; the actual content of the latest available issues was also viewed. Though the last two mentioned journals are not among the most authoritative periodicals in the world, their thematic content is the *most* consistent with the theme of "optoelectronics and optical systems". However, it would not be wise to select only these two journals as the sources of citations as the best papers seem to be submitted to slightly less strictly specialized journals, but *with a higher level of citedness*. Therefore, a thorough analysis of the thematic content of journals that are related, according to JCR, to the "Optics" subject category and are of a really high impact factor, provided us with an additional choice of journals "Nature Photonics", "Applied Optics" and "Optical Materials" as other sources of bibliographic references for the present study.

Thresholds for including the cited sources of information into the list of selected ones were determined as follows: first we selected the journals and other information sources that were cited (according to *Citing Journal Data*) in any of these five journals-sources at least eight times taking citations to all the publication years into account. This pre-selection comprised from 51.69% of citations for "Journal of Optoelectronics and Advanced Materials" up to 86.26% of citations for "Nature Photonics". For these pre-selected titles, citations in the five source journals to publications of the *publication window period* were summarized, and the titles of the cited sources that were cited eight or more times in 2010—2015 in all the five journals were included in the list. (In one of our previous empirical study o (Lazarev and Skalaban 2016), the threshold was twice set equal to 15 references, since this number of references, according to Price (1970), is associated with the average number of references in one tolerable journal article in natural sciences; therefore, we believed that "this number of references with respect to the annual array of the scientific journal can be considered minimal" (Lazarev and Skalaban 2016). However, in another case study (selection serials for nuclear power researchers), the concentration of references to the totality of cited documents turned out to be much higher: so much so that we were compelled to sharply reduce the selection threshold (Lazarev et al. 2017). In this study the threshold is between the ones accepted in (Lazarev and Skalaban 2016) and (Lazarev et al. 2017).)

The values of the "discipline impact factor" were determined for all the journals identified during the pre-selection (i.e. for the ones having at least 8 citations in any source journal, taking into account citations to all years of publication). The threshold value of the "discipline impact factor", as before (Lazarev and Skalaban 2016; Lazarev et al. 2017), was determined already after developing the list of serials based on the results of their total

citedness study by choosing it so that the number of cited items selected with the use of this indicator was as close as possible to the number of items from the list obtained with the use of total citedness data.

The cited serials were ranked by both the total number of received citations and the level of quotient from the division of the number of citations to the number of citable items (articles and reviews).

A number of cited sources included in the JCR's *Citing Journal Data* are not in the Journal Citation Reports' master list; moreover, some of them are individual books and other non-serial sources. We have already seen such citations while fulfilling the previous studies of this kind. As before (Lazarev and Skalaban 2016; Lazarev et al. 2017), we excluded those cited sources of information that proved to be impossible to identify, as well as those that were not serial publications and were found to be useless for the creation of the information environment being designed. We also merged data on the same sources that were cited under different abbreviated titles. Some examples of the excluded cited titles and of the titles that were cited under different abbreviations (the data on citedness of which were to be merged) will be discussed below. But first, we shall cnsider some cases of decrypting abbreviations, which were not identified with the aid of the JCR "master search".

Examples of decrypting abbreviations of cited serials not identified with the aid of the JCR "master search".

• We counted 23 citations to the title abbreviated as "ACTA OPT SINICA" that was not indexed in JCR and has not been decrypted with the aid of the JCR "master search". However, on the Internet there is web page of the journals entitled "Acta Optica Sinica" (http://www.opticsjournal.net/journals/aos.htm). The ISSN of this journal is 0253-2239. Nevertheless, in the on-line accessible ULRICHSWEB™ database this ISSN belongs to the journal entitled "Guangxue Xuebao". The ULRICHSWEB™ "title details" of "Guangxue Xuebao" contains the link to http://www.opticsjournal.net/Journals/gxxb.htm, following which we found the web page of this journal in Chinese. But it contains the link to the already familiar address of http://www.opticsjournal.net/journals/aos.htm, i.e. to the Anglophone version of this journal *also* entitled "Acta Optica Sinica". What is the right title that we ought to use? Apparently, the ULRICHSWEB™ data ought to be considered as master data, but as there is a wide practice to cite this journal under his English title (reflected in JCR), we put down this title in the list as "ACTA OPTICA SINICA / Guangxue Xuebao". (The Chinese perodical of "Optics and Precision Engineering" (aka "Guangxue Jingmi Gongcheng", ISSN 1004-924X) could be one more example of such kind, but it received only 7 citations, i.e. less than a threshold value.)

• The title abbreviated as "IMAGING APPL OPTICS" that was also not indexed in JCR and has not been decrypted with the aid of the JCR "master search" has received 14 citations. We have found on the Internet the resource entitled "Imaging and Applied Optics" which is an electronic collection of various conferences proceedings for several years (since 2012) published by the Optical Society of America and framed by the generalizing topic of Imaging and Applied Optics (https://www.osapublishing.org/conference.cfm?congress=ImagingOPC). Not in a very usual form, but it *is* a serial – that looks very convenient and very helpful, – and we have added it in the final list of the selected serials.

• The title abbreviated as "SPRINGER PROC PHYS" (which has also not been decrypted with the aid of the JCR "master search") was cited 27 times. In the on-line accessible ULRICHSWEB™ database there are "title details" related to the traditional print Monographic series entitled "Springer Proceedings in Physics" which "is devoted to timely reports of state-of-the-art developments in physics and related sciences", and we have added this apparently corresponding title to the list of selected serials.

• Finally, we wish to mention such a title abbreviated as "HIGH POWER LASER SCI" (cited 23 times, has not been decrypted with the aid of the JCR "master search" as well). The full title that seems to correspond to this abbreviation is "High Power Laser Science and Engineering", as we guess; and in the on-line accessible ULRICHSWEB™ database there are "title details" related to the "irregular journal" entitled exactly as we have just stated above. According to its web page (https://www.cambridge.org/core/journals/high-power-laser-science-and-engineering), this serial "publishes research that seeks to uncover the underlying science and engineering in

the fields of high energy density physics, high power lasers, advanced laser technology and applications and laser components", so, we by no means have added it to the list of selected serials being developed.

Examples of the titles not included in the final list of cited serials.

• The cited scientific journal "J MATERIAL CHEM" ("Journal of Materials Chemistry", ISSN: 0959-9428, ROYAL SOC. CHEMISTRY, ENGLAND) was published until 2012, and then it was replaced by three journals ("Journal of Materials Chemistry", Series A, B and C). At first glance, citations to the original journal should be taken into account as received by its successors. But technically it is impossible to determine the just proportion that should have been accounted for each section; also, thoughtless "transfer" of just one-third of the citations received by the non-existing journal to the "account" of each of the three successor journals does not seem to be the right solution. So, the citedness data of "Journal of Materials Chemistry" (but not of its successor journals) have been just excluded from consideration. The reason was the *structural reorganization of a journal.*

• Some of the titles has not been included in the final list of selected serials because of the *impossibility to decrypt abbreviated titles* of a number of cited sources of information. For example, "SID S" (19 citations) – is it "SID – Wiley **S**eries in Display Technology" (https://www.sid.org/Publications/SID-WileySeriesonDisplayTechnology.aspx) or "SID – International **S**ymposium/ Digest of Technical Papers" (https://onlinelibrary.wiley.com/journal/21680159, ISSN: 0097-966X)? We cannot admit that the compliance of this abbreviation to our proposed titles can be said with any confidence, and there is no full title to be found on the Internet that seemed to be fully appropriate. There are, in fact, a lot of other various "SIDs" on the Internet, including, a propos, the Society for Investigative Dermatology (https://www.sidnet.org/). Being unable to find a match, we were to exclude "SID S" from the further analysis.

• The cited title might *not* be *a serial* at al. E.g., we counted 9 citations to "HANDB OPTICS" which is apparently "Handbook of Optics" (https://www.mhprofessionalresources.com//handbookofoptics/), a McGraw-Hill multi-volume publication. The citations to it related to different years, and it is but natural as it was repeatedly reprinted. This publication is a useful source, but *not a serial*, so we have not included it in the list.

• Among the cited abbreviated titles there were also some *obviously unnecessary and at the same time not identifiable non-serial sources*. This wording is neither a paradox nor a mistake: we mean by it the cited sources called "PREPRINT "(23 citations)," THESIS" (11) and "COMMUNICATION" (20). That means that citations were given to some separate preprints, theses, and personal communications, – but on the basis of these abbreviated "titles" it is impossible to determine to *which* preprints, theses and personal communications the citations were given. So, these citedness data occurred to be of no use at all. At the same time, the data on separate preprints, theses, and personal communications are not needed for the information environment that is being designed. (Of course, there was a temptation to decrypt "PREPRINT" as the Web-platform called "preprints" (https://www.preprints.org/); and as for the "THESIS", there is an irregular publication entitled "Thesis" published in Russia and there is the journal entitled "Thesis" published in Greece (according to the ULRICHSWEB™ data). However, these facts cannot affect our interpretation: the platform of "preprints" appeared in 2016 (https://www.preprints.org/), while citations to "PREPRINT" referred to the earlier years; the Russian edition of "THESIS" is specialized in Social Sciences, and the Greek journal of the same title – in European politics, but not in problems of optics or related to optics.)

There were also citations to "WORKING PAP" and "TECH REP". It is easy to find out on the Internet a number of sources (including even serial publications) entitled as "WORKING PAPER", "WORKING PAPERS", "WORKING PAPER SERIES" etc. that are published by different organizations, and the titles of which are quite suitable to the "WORKING PAP" abbreviation, but it is impossible to point out which ones were really cited. Given the fact that "working papers" can be issued as just working documents of any practical organization, further guesses on the "WORKING PAP" abbreviation seem meaningless. The same relates to the abbreviation of "TECH REP". With regard to "TECH REP" it may be taken into consideration that there is the well-known site on personal computers and the relevant subculture, "the Tech Report PC Hardware Explored" (http://techreport.com), containing a lot of updated and replenished information, which can also be considered a specific serial source of

information. Examples of one-time technical reports of universities were also found on the Internet, and it is very likely, that some of such one-time publications were cited. But, time and again, it is impossible to establish *which* specific sources were meant by the references to "TECH REP".

Examples of the serials cited under different abbreviated titles.

• The cited serial entitled "SPIE – International Society for Optical Engineering. Proceedings" (the title is presented according to the ULRICHSWEB™ database; this is an annual publication published by the "S P I E - International Society for Optical Engineering", USA, ISSN 0277-786X) was abbreviated in the JCR as "P SOC PHOTO-OPT INST", "PROC SPIE" and "P SOC PHOTO-OPT INS". "INST" means no "Institute", but "instrumentation", as "SPIE" means "Society of Photo-Optical Instrumentation Engineers" as it is explained in the ULRICHSWEB™ database's "title details" of the "SPIE – International Society for Optical Engineering. Proceedings". Therefore, the citedness magnitudes of "P SOC PHOTO-OPT INST", "PROC SPIE" and "P SOC PHOTO-OPT INS" were summarized.

• Also, the serial entitled "AIP Conference Proceedings" (A I P Publishing LLC, USA, ISSN 0094-243X) was abbreviated in the JCR as both "AIP CONF P" and "AIP C PROC". The citedness values related to these two abbreviations were summarized.

Just as in the papers by Lazarev and Skalaban (2016) and Lazarev et al. (2017), in addition to the selection sources of information by analyzing their citedness in the specialized journals, we have undertaken also the selection of those items *that gave citations to* the specialized journals. Of course, the cause-effect relationships between the cited and citing objects that are reflected in citing data are different from the ones reflected in citedness data: the *citing* sources that are selected in this case are neither the most valuable for the expects in optoelectronics and optical systems nor the most used by them. However, the data on the quantity of citations that serials give to specialized journals representing a certain research field point to some extent to potential external applications of the results of scientific activities obtained within the framework of the research field (Lazarev and Skalaban 2016; Lazarev et al. 2017); therefore, the acquaintance of researchers with such sources is likely to help them to search for a possible application of their results in "external" research areas. (The property of value in this case is related to the cited specialized journals, not to the citing ones that are now under evaluation.)

Correspondingly, with the help of the "*Cited Journal Data*" section of JCR, we have selected serials with higher rates of the total citations they gave to the selected specialized journals in 2015 (the citation window is 1 year), or, rather, to their publications of 2010-2015 (the publication window is "5+1" years). The threshold values were chosen exactly as for the total citedness of serials in the selected journals specialized in OOS.

The indicator "symmetrical" to the "discipline impact factor" that has been called "discipline susceptibility factor" in the paper by Lazarev and Skalaban (2016) was calculated in a way somewhat different that the "discipline impact factor" was calculated. Since the number of articles published in 2010-2015 in cited specialized journals which can be cited in the citing serials under evaluation, is constant, division of the number of citations given by the serials being evaluated *to this number* would not change the meaning of the fractional indicator as compared with a total citing level. The use of such a fractional indicator is meaningless at all, as the *citing, not cited* serials are now subjected to evaluation.

Therefore, all references made in 2015 to the above-mentioned specialized journals – which are now *objects*, not sources of citations – of the corresponding publication window were divided to the number of articles and reviews that were contained in the *citing* serials in 2015, i.e. during one year, not six: the citing serials are evaluated with an adjustment for their productivity in the year of citation. Their activity of citing the mentioned specialized journals *in an average article from the citing serial* of 2015, is evaluated.

The threshold value of the "discipline susceptibility factor", as before (Lazarev and Skalaban 2016; Lazarev et al. 2017), was determined already after the list of the serials based on the results of the study of their total citing the specialized journals had been developed by choosing it so that the number of citing items selected with the use of this indicator was as close as possible to the number of items from the list obtained with the use of total citing data.

RESULTS AND DISCUSSION

After elimination of unacceptable sources and merging the data on the same titles which were cited under different abbreviations, the list of cited publications was 301 titles which publications of the publication window were cited at least eight times.

The threshold value of the "discipline impact factor" was determined so that the number of cited items selected with the use of this indicator was as close as possible to the number of items from the list obtained with the use of total citedness data, i.e. to 301. This value was chosen as 0.004 that made it possible to include in the list 297 serials selected according to the "discipline impact factor" values. This added to the list 64 titles more i.e. 64 titles have been selected only with the use of the "discipline impact factor", and not of the total citedness figures. 365 titles were thus selected according either by the value of total citedness within the publication window or by the value of the "discipline factor impact", or by both of these indicators.

Similarly, 375 titles were chosen that cited in 2015 five journals specialized in OOS. Trying to choose the threshold value of the "discipline susceptibility factor" so that the lists being developed with the use of both indices were as much similar in the number of selected serials as possible, we chosen its value as 0,026. As a result, exactly 375 titles were chosen according to the "discipline susceptibility factor" values. The number of titles that were selected exclusively by "discipline susceptibility factor" values was 43. The complete list of selected titles included 538 items. In its full format, it is featured in the table entitled "Main serials that support the quality of research in optoelectronics and optical systems and their characteristics", which is located in the *figshare* repository, viz., at https://figshare.com/articles/Main_serials_that_support_the_quality_of_research_in_optoelectronics_and_optical_systems_and_their_characteristics/6794006. Titles of the serials are arranged in this table in descending order of their total citedness level in journals specialized in OSS; if such value does not exist or if its value is less than the threshold, so the titles are arranged in descending order of the "discipline impact factor"; in the absence of such value or in case of its value is less than the threshold, so the titles are arranged in descending order of the total level of citations that serials give to the journals specialized in OSS; in the absence of such value or in case of its value being less than the threshold, so the titles are arranged in descending order of the "discipline susceptibility factor". The same descending order is adopted for Table 1, which is presented below in the article and consists of a significantly shortened version of the full table available from the *figshare* repository. Further explanations to Table 1 can be viewed in its legend.

Is it possible to talk about more and less priority components of the methodology applied in the fulfilled research? There is no doubt that if there is an opportunity to use *all* the selected serials in the information environment that is being designed, this should be done. In the absence of such an opportunity, it must be borne in mind that if the magnitude of the total number of references to the cited serial within the publication window reflects the value of the cited serial *in toto,* while the magnitude of the "discipline impact factor" reflects the value of *an average article* from it; in practice this means that the first indicator reflect serials that supposedly contain a *greater number of valuable articles*. Therefore the first approach has some advantage. Similarly, serials selected and evaluated in accordance with the magnitude of their citations given *to* the specialized journals should be approached in the analogous way. At the same time it must be remembered that the indices of the second pair no longer directly relate to the concept of value, and therefore should be applied in the second turn. In a word, the order presented in our methodology description fully reflects the relative priority of the application of its components.

Some comments to the citation data of some of selected serials seem to be of an interest. With this regard we wish to attract the reader's attention to the citedness magnitudes of the "PLoS One" mega-journal and of another heavily productive journal, "Proceedings of the National Academy of Sciences of the United States of

Table 1. The serials that have been selected for scientific information support of researchers in in optoelectronics and optical systems and their characteristics

Cited or citing serial entitled as abbreviated in JCR (if indexed)	CΣ	CΣ rank	Pc(2015-2010)	CΣ/Pc	CΣ/Pc rank	RΣ	RΣ rank	Pr(2015)	RΣ/Pr	RΣ/Pr rank	ISSN	Publisher	Country	Original title of cited or citing serial	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
OPT EXPRESS	2328	1	19013	0,1224	13	2419	1	3321	0,7284	18	1094-4087	OPTICAL SOC AMER	UNITED STATES	OPTICS EXPRESS	
APPL OPTICS	1518	2	7303	0,2079	4	1673	3	1563	1,0704	10	1559-128X	OPTICAL SOC AMER	UNITED STATES	APPLIED OPTICS	
OPT LETT	1195	3	9638	0,124	12	888	5	1478	0,6008	28	0146-9592	OPTICAL SOC AMER	UNITED STATES	OPTICS LETTERS	
SPIE - International Society for Optical Engineering. Proceedings (*)	827	4				2126	2				0277-786X	S P I E - International Society for Optical Engineering	United States	SPIE - International Society for Optical Engineering. Proceedings	
NAT PHOTONICS	614	5	703	0,8734	2	413	17	113	3,6549	4	1749-4885	NATURE PUBLISHING GROUP	ENGLAND	Nature Photonics	
APPL PHYS LETT	604	6	27796	0,0217	92	658	8	3437	0,1914	115	0003-6951	AMER INST PHYSICS	United States	APPLIED PHYSICS LETTERS	
OPT MATER	574	7	2640	0,2174	3	596	11	597	0,9983	11	0925-3467	ELSEVIER	NETHERLANDS	OPTICAL MATERIALS	
OPT COMMUN	429	8	5909	0,0726	29	616	10	1041	0,5917	30	0030-4018	ELSEVIER	NETHERLANDS	OPTICS COMMUNICATION	
PHYS REV LETT	398	9	18898	0,0211	98	559	12	2500	0,2236	97	0031-9007	AMER PHYSICAL SOC	United States	PHYSICAL REVIEW LETTERS	
J LUMIN	361	10	3539	0,102	19	268	26	575	0,4661	46	0022-2313	ELSEVIER	NETHERLANDS	JOURNAL OF LUMINESCENCE	
J APPL PHYS	353	11	24490	0,0144	128	269	25	3268	0,0823	201	0021-8979	AMER INST PHYSICS	United States	JOURNAL OF APPLIED PHYSICS	
J ALLOY COMPD	322	12	14610	0,022	90	280	22	3348	0,0836	200	0925-8388	ELSEVIER	SWITZERLAND	JOURNAL OF ALLOYS AND COMPOUNDS	
NANO LETT	239	13	6247	0,0383	56	474	15	1260	0,3762	63	1530-6984	AMER CHEMICAL SOC	United States	NANO LETTERS	
NAT COMMUN	237	14	8783	0,027	75	627	9	3192	0,1964	113	2041-1723	NATURE PUBLISHING	ENGLAND	Nature Communications	

												GROUP			
IEEE PHOTONIC TECH L	218	15	3781	0,0577	40	214	33	644	0,3323	69	1041-1135	IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC	United States	IEEE PHOTONICS TECHNOLOGY LETTERS	
OPTIK	214	16	5585	0,0383	55	263	28	1185	0,2219	98	0030-4026	ELSEVIER	GERMANY	OPTIK	
OPT ENG	206	17	3595	0,0573	42	278	24	540	0,5148	37	0091-3286	SPIE-SOC PHOTO-OPTICAL INSTRUMENTATION ENGINEERS	United States	OPTICAL ENGINEERING	
SCIENCE	199	18	5062	0,0393	53	86	84	828	0,1039	172	0036-8075	AMER ASSOC ADVANCEMENT SCIENCE	United States	SCIENCE	
OPTOELECTRON ADV MAT	198	19	1805	0,1097	17	173	44	290	0,5966	29	1842-6573	NATL INST OPTOELECTRONICS	ROMANIA	Optoelectronics and Advanced Materials-Rapid Communications	
J LIGHTWAVE TECHNOL	190	20	2950	0,0644	34	243	29	640	0,3797	62	0733-8724	IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC	United States	JOURNAL OF LIGHTWAVE TECHNOLOGY	
NATURE	186	21	5188	0,0359	60	58	114	897	0,0647	235	0028-0836	NATURE PUBLISHING GROUP	ENGLAND	NATURE	
ADV MATER	183	22	5261	0,0348	66	371	18	988	0,3755	64	0935-9648	WILEY	GERMANY	ADVANCED MATERIALS	
J PHYS CHEM C	179	23	19307	0,0093	178	328	20	3260	0,1006	179	1932-7447	AMER CHEMICAL SOC	United States	Journal of Physical Chemistry C	
PHYS REV A	171	24	16322	0,0105	165	870	6	2545	0,3418	67	2469-9926	AMER PHYSICAL SOC	United States	PHYSICAL REVIEW A	
OPT LASER ENG	170	25	1248	0,1362	9	151	49	197	0,7665	15	0143-8166	ELSEVIER	ENGLAND	OPTICS AND LASERS IN ENGINEERING	
APPL SURF SCI	170	25	12216	0,0139	136	113	64	2714	0,0416	302	0169-4332	ELSEVIER	NETHERLANDS	APPLIED SURFACE SCIENCE	
J OPT SOC AM A	169	27	1959	0,0863	24	133	53	227	0,5859	31	1084-7529	OPTICAL SOC AMER	United States	JOURNAL OF THE OPTICAL SOCIETY OF AMERICA A-OPTICS IMAGE SCIENCE AND VISION	
J OPT SOC AM B	169	27	2581	0,0655	33	215	32	353	0,6091	26	0740-3224	OPTICAL SOC AMER	United States	JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS	

<...>															
CHIN OPT LETT	92	50	1707	0,0539	46	120	59	254	0,4724	43	1671-7694	CHINESE LASER PRESS	PEOPLES R CHINA	Chinese Optics Letters	
<...>															
P NATL ACAD SCI USA	66	67	21940	0,003		74	93	3281	0,0226	375	0027-8424	NATL ACAD SCIENCES	United States	PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA	
<...>															
CHINESE PHYS LETT	37	109	4474	0,0083	195	82	87	539	0,1521	141	0256-307X	IOP PUBLISHING LTD	PEOPLES R CHINA	CHINESE PHYSICS LETTERS	
<...>															
AIP Conference Proceedings (*)	26	144				49	128				0094-243X	A I P Publishing LLC	United States	AIP Conference Proceedings	
<...>															
ACTA OPTICA SINICA / Guangxue Xuebao	23	153									0253-2239	Zhongguo Kexueyuan Shanghai Guangxue Jingmi Jixie Yanjiusuo	PEOPLES R CHINA	ACTA OPTICA SINICA / Guangxue Xuebao	
<...>															
PLOS ONE	19	171	133551	0,0001		22	217	28114	0,0008	544	1932-6203	PUBLIC LIBRARY SCIENCE	United States	PLoS One	
<...>															
IEEE Conference on Computer Vision and Pattern Recognition. Proceedings	18	175									1063-6919	I E E E Computer Society	United States	IEEE Conference on Computer Vision and Pattern Recognition. Proceedings	
<...>															
Imaging and Applied Optics	14	209									нет	Optical Society of America	United States	Imaging and Applied Optics	
<...>															
OPT REV	12	226	616	0,0195	104	30	174	122	0,2459	89	1340-6000	OPTICAL SOC JAPAN	Japan	OPTICAL REVIEW	
<...>															

ROM REP PHYS	5		702	0,0071	214	43	138	133	0,3233	70	1221-1451	EDITURA ACAD ROMANE	Romania	Romanian Reports in Physics	
<...>															
J VISION	7		1661	0,0042	292						1534-7362	ASSOC RESEARCH VISION OPHTHALMOLOGY INC	United States	JOURNAL OF VISION	
<...>															
INDIAN J PURE AP PHY	3		745	0,004	295						0019-5596	NATL INST SCIENCE COMMUNICATION-NISCAIR	India	INDIAN JOURNAL OF PURE & APPLIED PHYSICS	
<...>															
SCI CHINA CHEM						36	157	229	0,1572	132	1674-7291	SCIENCE PRESS	Peoples R CHINA	Science China-Chemistry	
<...>															
CHEM LETT						23	210	562	0,0409	304	0366-7022	CHEMICAL SOC JAPAN	Japan	CHEMISTRY LETTERS	
<...>															
ELECTRON MATER LETT						20	228				1738-8090	KOREAN INST METALS MATERIALS	SOUTH KOREA	Electronic Materials Letters	
<...>															
CHINESE J INORG CHEM						14	266	317	0,0442	297	1001-4861	CHINESE CHEMICAL SOC	Peoples R CHINA	CHINESE JOURNAL OF INORGANIC CHEMISTRY	
<...>															
IEEE T MAGN	1		6477	0,0002		12	296	1189	0,0101		0018-9464	IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC	UNITED STATES	IEEE TRANSACTIONS ON MAGNETICS	
<...>															
ADV POWDER TECHNOL						10	328	216	0,0463	289	0921-8831	ELSEVIER SCIENCE BV	JAPAN	ADVANCED POWDER TECHNOLOGY	
<...>															
Lecture Notes in Computer Science	7					8	353				0302-9743	Springer	Germany	Lecture Notes in Computer Science	
<...>															

MACH SCI TECHNOL						4		28	0,1429	145	1091-0344	TAYLOR & FRANCIS INC	UNITED STATES	MACHINING SCIENCE AND TECHNOLOGY	
<...>															
PROG BIOCHEM BIOPHYS						3		119	0,0252	363	1000-3282	CHINESE ACAD SCIENCES, INST BIOPHYSICS	PEOPLES R CHINA	PROGRESS IN BIOCHEMISTRY AND BIOPHYSICS / Shengwu Huaxue yu Shengwu Wuli Jinzhan	

CΣ is total citatedness of a serial (2015-2010 citable papers) in the five journals specialized in optoelectronics and optical systems (in 2015); **CΣ rank** is its rank; **Pc(2015-2010)** is the number of "citable items" in a cited serial in 2015-2010 (taken from JCR, if available); **CΣ/Pc** is the value of "the discipline impact factor"; **CΣ/Pc** rank is its rank; **RΣ** is it total number of citations that serial gave in 2015 to the five journals specialized in optoelectronics and optical systems (2015-2010 citable papers); **RΣ rank** is its rank; **Pr(2015)** is the number of articles and reviews that could cite the specialized journals in 2015; **RΣ/Pr** is the "discipline susceptibility factor"; **RΣ/Pr rank** is its rank. **ISSN**, **country**, **publisher** are the relevant reference characteristics of the serials (the data are taken from the JCR Key Indicators or, if they are not available there, the data are taken from the Ulrichsweb™ database, or, if they are not available in the Ulrichsweb™ database, the data of a web site or a web page of a serial or a publisher are taken). If there are different international standard serial numbers (ISSNs) of serials (for example, individual ISSNs for printed, on-line, and CD-rom versions), we present only the ISSN for the printed version.

The grey background means conference proceedings, the red background stands for an Internet-resource, the lilac one – for monographic series.

Values less than threshold are typed in red (and are given if the serial is included in the list in accordance with another index or indices value). The ranks for the values that are less than the threshold are not presented.

(*) means merged data for those serials which titles were differently abbreviated in JCR (that caused repeated registration of one and the same serial).

America". "PLoS One" published 133,551 citable papers in 2010-2015, and 19 citations given to this journals by five specialized journals could not provide any noticeable value of the "discipline impact factor" of this journal. Also, 28,114 potentially citing papers that were published in "PLoS One" in 2015, containing 22 citations to the five journals specialized in OOS, could not provide the noticeable value of the "discipline susceptibility factor" of "PloS One": in fact, it is 8 times higher than the "discipline impact factor" magnitude, but is still miserable. However, it does not in the least mean that the "PLoS One" journal itself is of a small value for the researchers in optoelectronics and optical systems; it means that it contains a lot of papers that they do not need. But isn't it but natural for a journal that publishes results obtained in all scientific disciplines?! And as for the "Proceedings of the National Academy of Sciences of the United States of America", this journals was cited 66 times, but as it had as much as 21,940 "citable items" in 2015-2010, its "discipline impact factor" value is also less than a threshold.

On the contrary, such journals as "Journal of Vision" (United States), "Romanian Reports in Physics" (Romania), and "Indian Journal of Pure & Applied Physics" (India) were cited just 7, 5 and 3 times respectively, but as they were not much productive in 2015-2010, they all had such values of the "discipline impact factor" that are higher than the threshold or equal to it.

Much more comments (which are, as we believe, are more interesting, too) were generated by the results of our previous studies of this kind (Lazarev and Skalaban 2016, Lazrev et al. 2017, Lazarev and Yurik 2018).

CONCLUSIONS

1. A comprehensive methodology for evaluation and selecting world scientific journals and other serials that are necessary for the qualitative execution of research in specific natural or/and technical fields was applied; it is based on the use of citation analysis of serials in the citation window equal to 1 year and takes the total citedness of serials in *selected specialized source journals* into account, as well as the calculation of the "discipline impact factor", i.e. an indicator somewhat similar to the impact factor (the ratio of the number of citations to the number of publications), whose numerator, however, contains the data of citedness of the serials being selected not in *all* the journals indexed by JCR but that in *selected specialized* journals. The differences in the methodology are as follows: the publication window is chosen as "5 + 1 years", that is, the previous five years and the year during which references were taken into account; the methodology also involves selection based on the data of citing the *specialized journals by the serials being evaluated* in the citation window equal to 1 year, the publication window being equal to "5 + 1 years"; *citing* journals, respectively, are also selected. One more difference is the calculation of the "discipline susceptibility factor", that is, the number of citations in a serial being evaluated given during one year to the publications of specialized journals of the publication window divided by the number of publications in *citing* serials during one year.

2. With the application of the outlined methodology, the task of selecting world scientific journals and other serials necessary for the implementation of research in optoelectronics and optical systems has been performed. Given the threshold values, a list of 538 serial titles was obtained, of which 365 serials (67.84%) subject to priority selection were listed either by the value of total citedness within the publication window or by the value of the discipline factor impact, or both of these indicators.

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