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Why is TASK Quarterly a Significant Journal to Publish Your Article? – A Bibliometric Analysis of a Scientific and Technical Journal

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Abstract

A bibliometric analysis of TASK Quarterly in the years 1997-2021 in terms of various bibliometric indicators was performed to celebrate the 25th anniversary of the publication of the first issue of the journal. The number of publications and citations increased over the mentioned span of years. The leading countries in terms of the greatest number of papers published in TASK Quarterly are Poland, Italy, Germany, Ukraine, USA and Russia. Moreover, it is shown that international collaboration can result in a greater number of citations per publication. The average publication time in TASK Quarterly is 77 days, including the average submission-acceptance time (44 days) and the average acceptance-publication time (33 days). Based on the author's findings, it can be seen that although TASK Quarterly is a journal devoted mainly to physical and computer sciences, many publications also focus on the aspects related to mathematics, biomedical engineering and biophysics. CFD, molecular dynamics, the finite element method (FEM) and numerical simulations are the most frequently used keywords in articles published in TASK Quarterly.

Keywords:

publications; citations; bibliometric analysis

ABBREVIATIONS

AMP — Analysis and Mathematical Physics
ARWU — ranking in the general ARWU university rankings
BDR — Big Data Research
FF — Fractal and Fractional
HT — hybrid-transformative
IJAMCS — International Journal of Applied Mathematics and Computer Science
ME — Mathematics in Engineering
OA — Open Access
PJCS — PeerJ Computer Science
QS — ranking in the general QS university rankings
RMS — Research in the Mathematical Sciences
SIAM — SIAM Journal on Mathematics of Data Science
SP — Science Progress
TQ — Task Quarterly
TP — number of publications
TP/INH — number of publications per million inhabitants
TC — number of citations
TC/TP — number of citations per publication

1. Introduction

TASK Quarterly is a scientific Open Access journal which publishes various types of materials (i.e. articles, reviews, book chapters, editorial materials) four times a year under the Creative Commons CC BY 4.0 license. It means that articles in *Task Quarterly* can be read, downloaded, copied, distributed, printed, searched without asking for prior permission from the publisher or the authors. The publisher of TASK Quarterly is the Centre of Informatics, Tri-City Academic Supercomputer and networK (CI TASK) at the Gdańsk University of Technology. The first issue of *Task Quarterly* was published in 1997. The current editor-in-chief is Prof. Jarosław Rybicki, and the assistant and managing editor is Kamil Rybacki. The editorial team of the journal is composed of 11 scientists from various countries including Poland, Greece, USA, Italy and New Zealand. Although TASK Quarterly is not indexed in the Web of Science and Scopus, it is worth noting that it is indexed in DOAJ, EBSCO, Google Scholar, Library of Science, BazTech and INSPEC (until 2016). Moreover, it is worth noting that TASK Quarterly can be found on the Ministry's list of scientific journals and reviewed materials of international conferences with 20 points. Interestingly, TASK Quarterly does not charge any fees for article processing. Additionally, it is worth highlighting that articles in *Task Quarterly* should be written in English. The main aim of *Task Quarterly* is original research in a selected discipline related to engineering (biomedical engineering, electrical and electronic engineering, technical IT and telecommunications, nanotechnology) as well as natural sciences (i.e. mathematics, computer sciences, physical sciences, biophysical sciences). In particular, the journal is devoted to concepts related to computational and numerical methods as well as information systems and technologies, including high computing power infrastructure applications and artificial intelligence methods [1, 2]. Furthermore, it is worth adding that TASK Quarterly provides a common platform for presentation of articles (1).

Previous studies show that bibliometric analyses of selected journals were performed by scientists related to various scientific disciplines, such as: chemistry and biology [3, 4, 5], information and computer sciences including intelligent systems [6, 7, 8], economics and management sciences [9, 10, 11, 12, 13], other sciences [14, 15, 16, 17]. In particular, scientists very often provide an overview of the selected journals in terms of the most frequently used keywords, top countries, universities and authors, as well as the number of publications and citations.

The purpose of this work was to perform a bibliometric analysis of TASK Quarterly, which in 2022 celebrated the 25th anniversary of the publication of its first issue. In particular, many indicators related to the quantity and quality of publications were calculated. Furthermore, the publication time and the most frequently used keywords in publications in *Task Quarterly* were determined. The author's study also considered the top countries and institutions in terms of the greatest number of publications and citations per publication. Additionally, the effect of international collaboration on the number of citations is shown. The author's work may be very interesting for scientists who are going to publish their articles in a renown scientific journal devoted to natural sciences, such as: mathematics, physical sciences and computer sciences. Moreover, this paper can be helpful for readers as it presents an overview of TASK Quarterly publications and topics. The author's study could also be important for editors and publishers who would like to improve the process of publication, and therefore, would wish to compare their journal with other journals devoted to similar topics.

2. Research Methods

Information (i.e. titles of publications, names of authors and their countries/institutions, journal titles, publication types, publication years, publication times, keywords, number of pages, number of references and equations) about 785 publications published in *Task Quarterly* in the period of 1997-2021 was downloaded to perform a bibliometric analysis of the journal. The data was retrieved manually in the period from 19th to 30th September 2022 based on the Library of Science (2) and Baztech [18]. Data from the World Bank Data [19] was used to establish the country-level economic background and the number

of inhabitants in 2021. Next, information about the number of citations from Google Scholar [20] was also downloaded. The data was collected in the period from 20th to 22nd September 2022. All the results were analyzed in Microsoft Excel using pivot tables and charts. Next, information about the positions of top 14 universities in the world university rankings, such as: ARWU (Academic Ranking of World Universities) and QS World University Ranking [21, 22] was also downloaded.

The VosViewer software [23, 24] which allows visualization of co-occurrence maps and co-citation networks at the country, organization and author level [15] was used to estimate the most frequently used keywords in TASK Quarterly publications. Firstly, the most frequently used keywords were calculated for all publications and then, the total strength of the co-occurrence links with other keywords was determined. It is worth highlighting that the selected keywords were those with the greatest total link strength. A full counting method assuming that the minimum number of occurrences of a keyword was equal to 1 was used. The normalization of the association strength was selected and 2204 keywords were divided into 3 clusters containing 286, 142 and 111 items, respectively.

Finally, 6 journals (*Fractal and Fractional, Analysis and Mathematical Physics, Big Data Research, Mathematics in Engineering, Research in the Mathematical Sciences, SIAM Journal on Mathematics of Data Science*) based on the similar keywords used in the publication in TASK Quarterly and the number of citations per publication were selected to obtain a detailed picture about TASK Quarterly in comparison to other scientific journals. Other 3 journals were selected based on a similar number of publications in 1997-2021 and also similar keywords used. Information about the number of references was downloaded from the Web of Science database between 27-28th June 2023.

3. Results and Discussion

3.1. Insights into the number of publications in TASK Quarterly

As depicted in **Fig. 1**, the first materials (16 articles, 3 reviews and 3 other contributions) were published in *Task Quarterly* in 1997. Moreover, it can be seen that the number of publications increased from 22 in 1997 to 60 in 2003, and then, decreased to 24 in 2021. Additionally, as is shown in **Fig. 1**, the greatest number of papers (about 58-60) were published in 2003 and 2004, while the lowest number (14) were published in 2013 and 2020. **Fig. 1** reflects that 684 publications (87% of all published in 1997-2021) are articles, 65 (8%) are reviews, while 36 (5%) are publications of another type (i.e. appendixes, introductions, editorial materials, errata, book chapters, obituaries).

3.2. Insights into indicators related to citations in TASK Quarterly

It is well known that citations are a measure of the influence and impact of publications. Hence, it is interesting from the publisher's point of view to know which publications had the greatest number of citations. For this purpose, **Fig. 2A** shows the number of citations as a function of years, while in **Fig. 2B**, the number of citations per publication is depicted as a function of years. As revealed by analysis of citations over the span of years (**Fig. 2A**), it can be seen that the publications in 2002 and 2003 had the greatest number of citations, while those from the last years (2020-2021) had the lowest number of citations. On the other hand, if the number of citations per publication is taken into account, it can be seen that the greatest number of citations per publication was achieved by papers published in 2002 (9 citations per publication) and 2007 (8.5 citations per publication).

Fig. 3 shows that 113 publications had 1 citation, 58 - 2 citations, while 45 - 3-4 citations. Moreover, it can be seen that 80 publications, 10.3% of all, had more than 10 citations, while 2 papers published in TASK Quarterly had more than 100 citations. As depicted in **Fig. 3**, 444 contributions (57%) published in TASK Quarterly had at least one citation. Additionally, at this point, it is worth noting that the average number of citations per publication in TASK Quarterly is 4.4. As can be expected, if only articles are taken into account, it can be seen that the average number of citations per publication is greater (5.0), because usually articles are cited more often than other contributions.

Tab. 1 shows the most frequently cited publications in TASK Quarterly to provide a more detailed picture about contributions which had the greatest number of citations. In particular, it is found that it was the articles *Polish tagger TaKIPI: rule based construction and optimization*, and *GNXAS: a software package for advanced EXAFS multiple-scattering calculations and data-analysis* that had the greatest number of citations. It is worth noting that these articles were cited 116 and 107 times, respectively. Based on **Tab. 1**, it should be mentioned that only two articles with a Polish affiliation were ranked in the first ten positions, while other papers were written by authors from Italy, Australia, United Kingdom, Tunisia, Germany, Czech Republic and Belgium. Based on these findings, it can be claimed that the number of

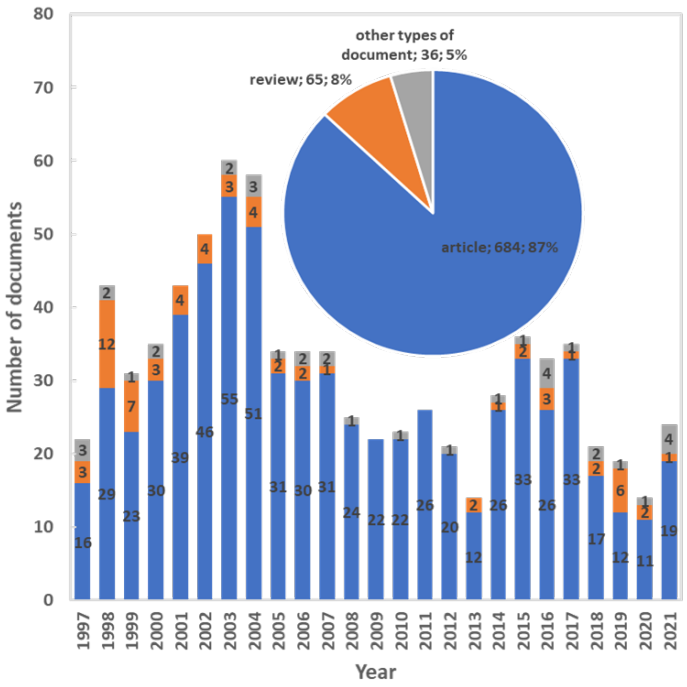

Figure 1: Annual number of publications in TASK Quarterly over the period of 1997-2021. The **inset** shows the number of publications as a function of their type

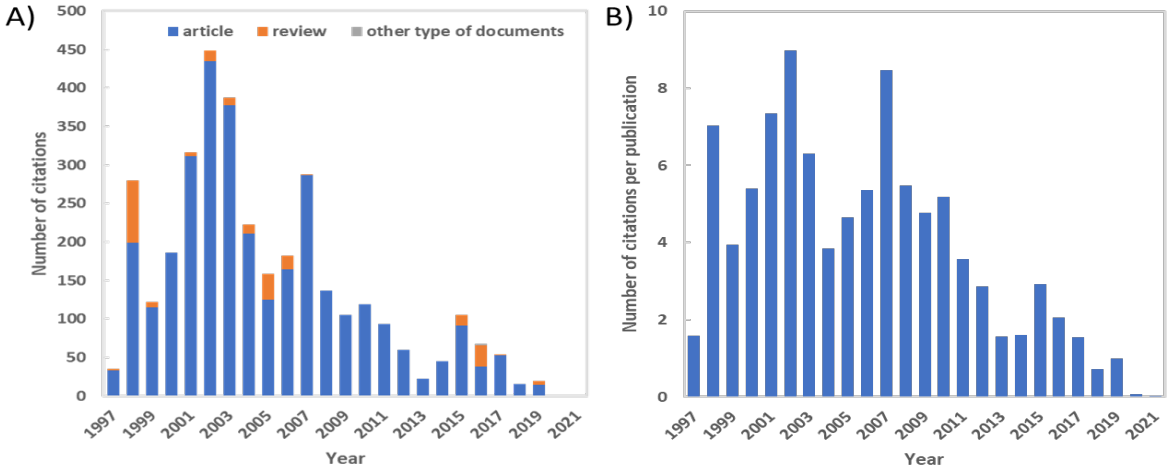

Figure 2: (A) Average number of citations per year, (B) Average number of citations per publication per year

citations depended on the author's nationality. Detailed information on the effect of the author's nationality on the number of citations is provided in the section on international/domestic collaboration.

3.3. Insights into the number of authors in TASK Quarterly

The size of author teams for publications in TASK Quarterly is also worth examining. In particular, **Fig. 4** shows that 289 publications (37%) were written by 1 author, 275 (35%) by 2 authors, 119 (15%) by 3 authors, 59 (8%) by 4 authors, 24 (3%) by 5 authors. Interestingly, 19 publications (2%) were written by more than 5 authors, while the average number of authors per publication in TASK Quarterly is 2.1. It means that authors who published their articles in TASK Quarterly prefer rather to write papers with other scientists.

Next, it was checked whether the number of articles written by more than one author increased over 25 years. In particular, **Fig. 5** shows that in the first 5 years (1997-2001), papers which were written by more than 1 author represent 52% of all papers published in *Task Quarterly*, while in the next years, this number is significantly greater being in the range of 64-68%. Based on these findings, it can be claimed that the number of articles which were published by more than 1 author increased in 25 years. Moreover, if selected years are taken into account, it can be seen that the number of papers published by

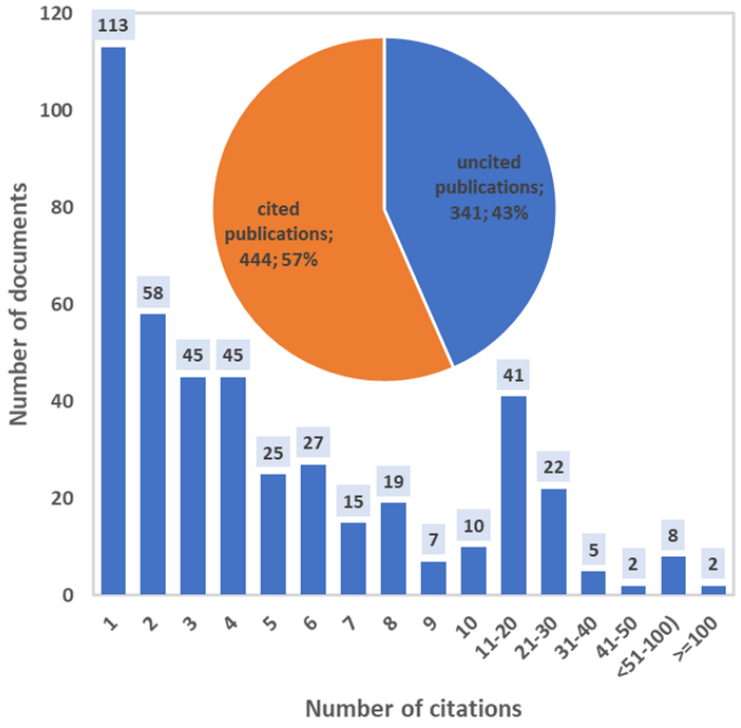

Figure 3: The number of publications as a function of the number of citations (bar graph) and the number of cited vs uncited publications in TASK Quarterly (pie chart)

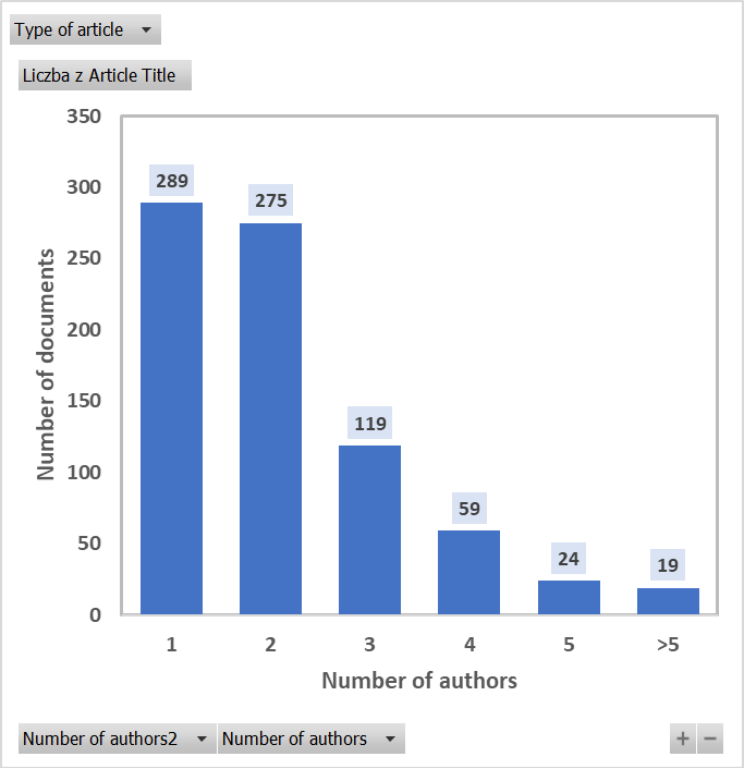

Figure 4: The number of publications in TASK Quarterly as a function of the number of authors

more than 1 author is greater than the number of papers published by a single author in all the years, excluding some years: 1998, 1999, 2007 and 2011-2013. Interestingly, although the greatest number of papers were published in the years 2002-2006, the greatest percentage of articles which have more than 1 author was observed in the years 2007-2011.

Tab. 2 shows the average number of authors per publication for all selected journals in order to obtain an overview about the average number of authors who published their papers in TASK Quarterly compared to other journals devoted to similar topics. In particular, it

Table 1: Most frequently cited articles published in TASK Quarterly. TC- number of citations

ID	TC	Article Title	Authors	Year	Affiliation Country
1	116	Polish tagger TaKIPI: rule based construction and optimization	Piasecki M.	2007	Poland
2	107	GNXAS: a software package for advanced EXAFS multiple-scattering calculations and data-analysis	Filipponi, A., Di Cicco A.	2000	Italy
3	97	Discrete element modeling of industrial granular flow applications	Cleary P.	1998	Australia
4	95	The effects of lean and sweep on transonic fan performance a computational study	Denton J. D.	2002	United Kingdom
5	76	Beta neuro-fuzzy systems	Alimi A. M.	2003	Tunisia
6	76	KAPPA - Karlsruhe parallel program for aerodynamics	Magagnato F.	1998	Germany
7	69	Automatic shape optimisation of hydro turbine components based on CFD	Eisinger R., Ruprecht A.	2002	Germany
8	67	Differential evolution with competitive setting of control parameters	Tvrdik J.	2007	Czech Republic
9	63	Performance prediction of centrifugal pumps with CFD-tools	Dick E., Vierendeels J., Serbruyns S., Vande Voorde J.	2001	Belgium
10	56	Numerical calculation of the steam condensing flow Numerical simulation and	Dykas S.	2001	Poland
11	43	Theoretical analysis of the 3D viscous flow in centrifugal impellers	Kang S., Hirsch Ch.	2001	Belgium
12	41	Numerical simulation of 3D flow in axial turbomachines	Yershov S., Rusanov A. V., Gardzielewicz A., Lampart P., Świrdyczuk	1998	Ukraine; Poland
13	37	Numerical simulation of model helicopter rotor in hover	Doerffer P., Szulc O.	2008	Poland
14	35	Function optimization by the immune metaphor	Wierzchoń S. T.	2002	Poland
15	33	Application of weighted myriad filters to suppress impulsive noise in biomedical signals	Pander T.	2004	Poland
16	32	Modelling of silo discharge and filling problems by the material point method	Więckowski Z.	2003	Poland
17	31	The elasto-viscoplastic Chaboche model	Ambroziak A., Kłosowski P.	2006	Poland
18	30	A probabilistic approach to fuzzy and crisp interval ordering	Sevastjanov P. V., Rog P.	2003	Poland
19	30	Effect of exit blade angle, viscosity and roughness in centrifugal pumps investigated by CFD computation	Li W.	2011	China
20	29	NANOPACK: parallel codes for semiempirical quantum-chemical calculations of large systems in the sp- and spd-basis	Berzigiyarov P. K., Zayets V. A., Ginzburg I. Ya., Razumov V. F., Sheka E. F.	2002	Russia
21	29	Simulations of the water freezing process: numerical benchmarks	Michałek T., Kowalewski T. A.	2003	Poland

can be seen that TASK Quarterly as well as *Analysis and Mathematical Physics* have the smallest average number of authors per article (2.1). Other journals have a slightly greater average number of authors per article, usually in the range of 2.2-4.0.

3.4. Insights into the number of equations in TASK Quarterly. Comparison of the number of references in TASK Quarterly and other selected journals.

It follows from Fig. 6 that 310 articles do not contain any equations, while 128 have about 1-5 equations. Interestingly, 41 articles have more than 50 equations.

Table 2: Average number of authors in journals which published articles devoted to similar topics in comparison to TASK Quarterly

Journal	Average number of authors
IJACS	2.6
PJCS	4.0
TQ	**2.1**
SP	3.3
FF	3.5
AMP	2.1
BDR	3.9
ME	2.5
RMS	2.2
SIAM	3.2

Furthermore, it is worth noting that Fig. 6B shows that 475 articles, which constitutes 61% of all publications in

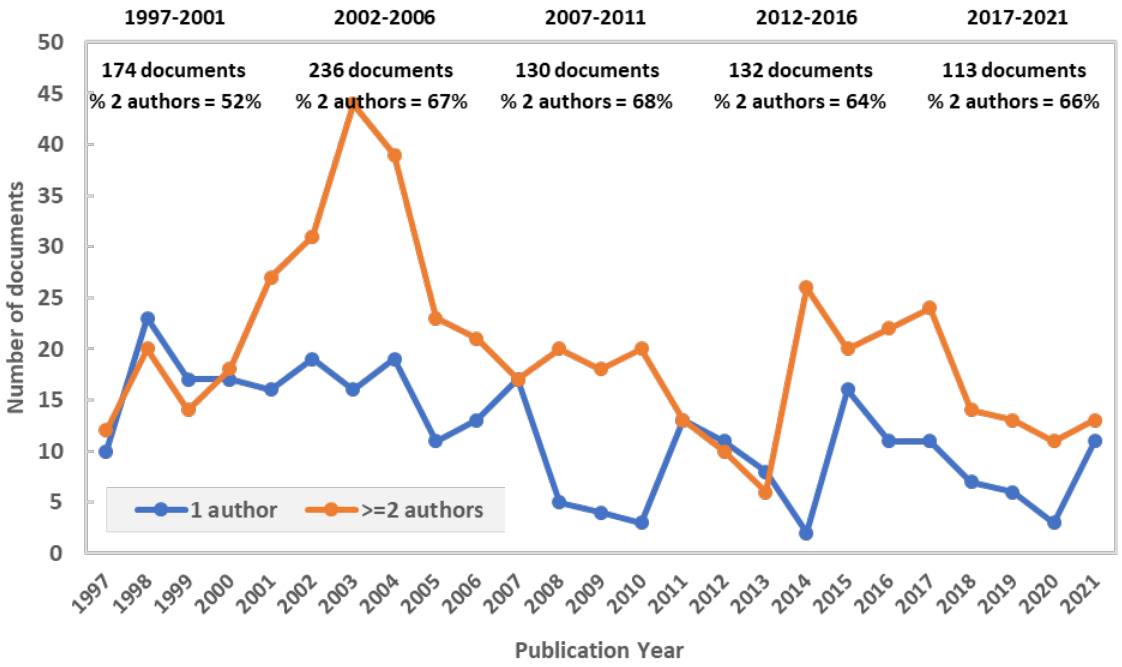

Figure 5: The number of publications in TASK Quarterly as a function of the number of authors and the publication year

TASK Quarterly, contain equations. The average number of equations in articles published in *Task Quarterly* is 13. It means that these papers are related rather to mathematics and physical sciences.

3.5. The number of papers with and without equations in *Task Quarterly*

As depicted in **Fig. 7**, 716 papers (91% of all papers published in TASK Quarterly) have at least one reference. The greatest number of papers (38) have 10 references, followed by 36 papers which have 7 references and 33 papers which have 9, 5 or 8 references. Additionally, it is worth noting that 7 papers, which constitutes 0.89% of all papers published in *Task Quarterly,* have more than 100 references. The average number of references for papers published in TASK Quarterly is 18. Based on these findings, it can be suggested that authors who have published their articles in *Task Quarterly* have knowledge about other scientific papers related to the selected topic.

In particular, it is found that the selected journals have greater percentage of publications which have at least one reference (in the range of 95-100%). Interestingly, some journals, such as: *Peer J Computer Science* and *Science Progress* have 66 and 72 papers with more than 100 references, respectively. If the average number of references is compared, it can be seen that other journals have significantly greater average values in comparison with TASK Quarterly (in the range of 27-50). On the other hand,

3.6. Insights into the publication time in TASK Quarterly

From the point of view of scientists, it is interesting to know the publication time in the journal in which they want to publish their articles. Hence, the publication times including the submission-acceptance (S-A) time and the acceptance-publication (A-P) time for papers which were published in TASK Quarterly in the years 1997-2021 were calculated. At this point, it is worth mentioning that the S-A time is defined as the time needed for a peer review, including the number of rounds of the peer review, the time that editors take to inform authors about an immediate rejection/ acceptance of a manuscript, the time needed for authors' responses to the requested changes according to reviewers' recommendations, the time needed for paper revisions and resubmitting. On the other hand, the A-P time is defined as the publishing process time, especially: the time needed for proofreading, editing, final formatting of the paper [25, 26, 27, 28]. In **Fig. 8** the maximum, minimum and average publication times for papers published in TASK Quarterly are shown. Firstly, it is worth noting that papers published in the years 2015-2021 have information about the publication time. On the other hand, it is worth adding that publications in the years 1997- 1999 do not provide such information, while papers published in the years 2000-2014 contain information only about received and/or revised dates. As revealed in **Fig. 8**, the maximum and minimum publication times were observed in 2021 - 178 and 10 days, respectively.

The longest average publication time (113 days) was

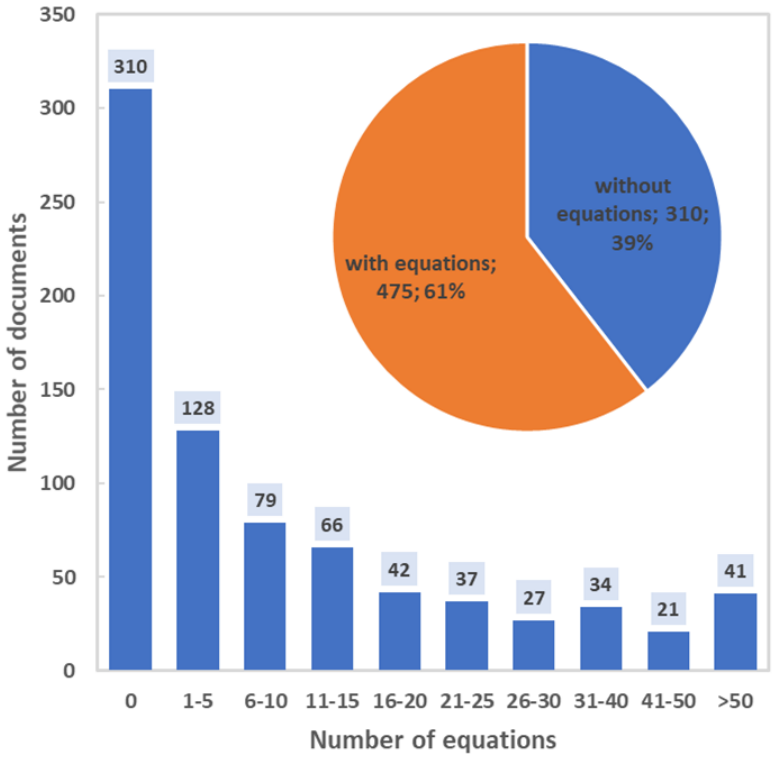

Figure 6: The number of papers as a function of the number of equations

observed in 2021, while the lowest average publication time (54 days) was seen in 2017. Additionally, it is worth noting that the average publication time for papers published in TASK Quarterly is 77 days, where the average S-A time is 44 days and the average A-P time is 33 days.

Fig. 9 shows that 40 papers have the A-P time longer than the S-A time. According to **Fig. 9**, it can be also seen that only 168 papers (21%) have information about the publication time, including the S-A and A-P times.

The number of papers as a function of publication times (**Fig. 10A**), especially the S-A (**Fig. 10B**) and A-P times (**Fig. 10C**) is also shown to provide a more detailed picture about the publication time. In particular, it can be seen that the greatest number of papers (53) have the publication time in the range of 40-60 days. However, it is worth adding that 12 papers have the publication time shorter than 40 days, including 2 papers with the publication time of 10 and 14 days. **Fig. 10A** also shows that 34 papers have a very long publication time (>100 days). Based on **Fig. 10B**, it can be concluded that the greatest number of papers (59) have the S-A time in the range of 30-40 days. Interestingly, 2 papers have a very short S-A time (<10 days). As far as the A-P time is considered, it can be seen that in the case of 10 papers it is shorter than 10 days, while for 7 papers it is longer than 100 days. Furthermore, as revealed in **Fig. 10C**, the greatest number of papers (60) have the A-P time in the range of 10-20 days.

To improve the publication process, the website of TASK Quarterly should provide information about the average publication time, including the S-A and A-P times. Such data has a significant role from the point of view of scientists, as they want to publish their articles quickly. Hence, reviewers of TASK Quarterly should try to review manuscripts as fast as possible to encourage a greater number of scientists to publish their articles in the journal. Furthermore, reviewers should provide authors with the essential guidelines indicating the main aspects to correct or improve.

3.7. Insights into international/domestic collaboration in TASK Quarterly.

It is well known that national and international collaboration can effect the quality of publications [29, 30, 31, 31]. Hence, from the point of view of a scientist, it is important to understand the effect of international and domestic collaboration on the greater number of citations.

The number of countries from which authors published their works in TASK Quarterly is shown in **Fig. 11A** to provide an overview about papers published in TASK Quarterly, especially in terms of the international collaboration. In particular, it is shown that 692 papers (88%) were written by authors from 1 country, 84 papers were written by authors from 2 countries, while 9 papers were written by authors from 3-5 countries. The percentage of publications written by authors from Poland and other countries is also shown to provide a more detailed overview of countries from which authors published their articles in

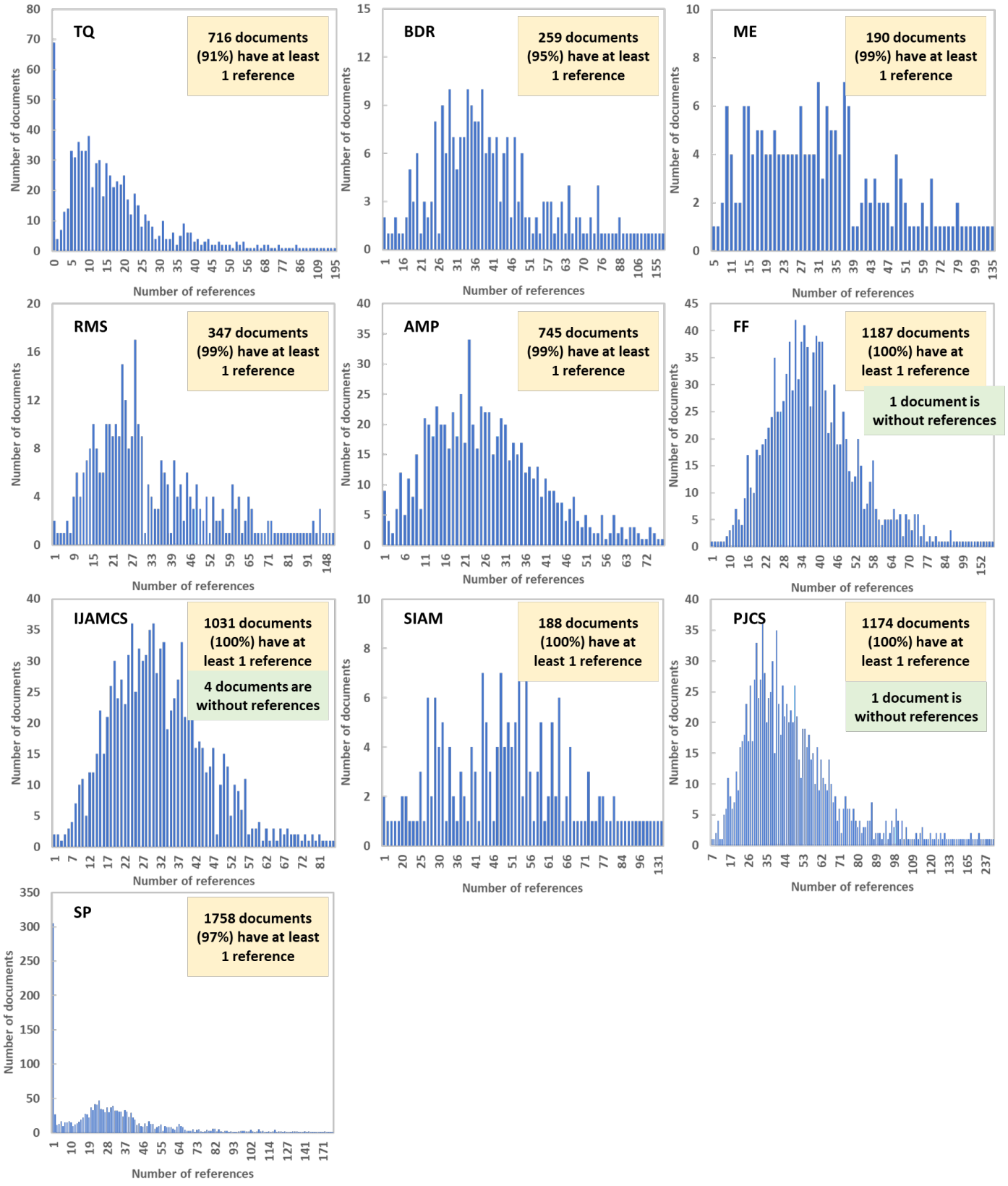

Figure 7: The numbers of references for 9 selected journals were compared to obtain an insight into other journals which published papers devoted to similar topics

TASK Quarterly. In particular, as presented in **Fig. 11B**, it can be seen that 609 papers (68%) were published by authors from Poland, while other papers were published by authors from other countries.

Next, in **Fig. 12**, it is also determined how many articles were published by scientists from other countries. In particular, it is shown that the greatest number of papers in TASK Quarterly were published by scientists from Italy (52), Germany (34), Ukraine (32), USA (26) and Russia (25).

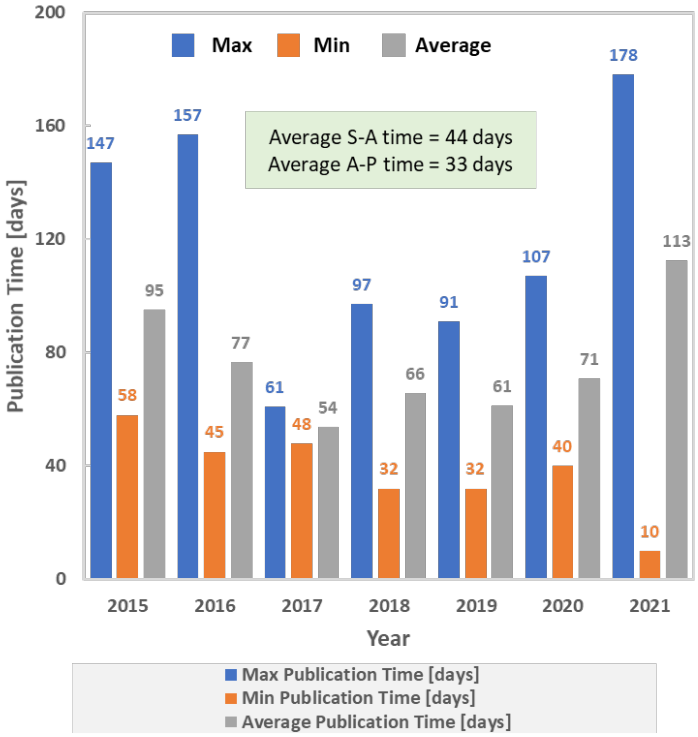

Figure 8: Maximum, minimum and average publication time in TASK Quarterly as a function of years

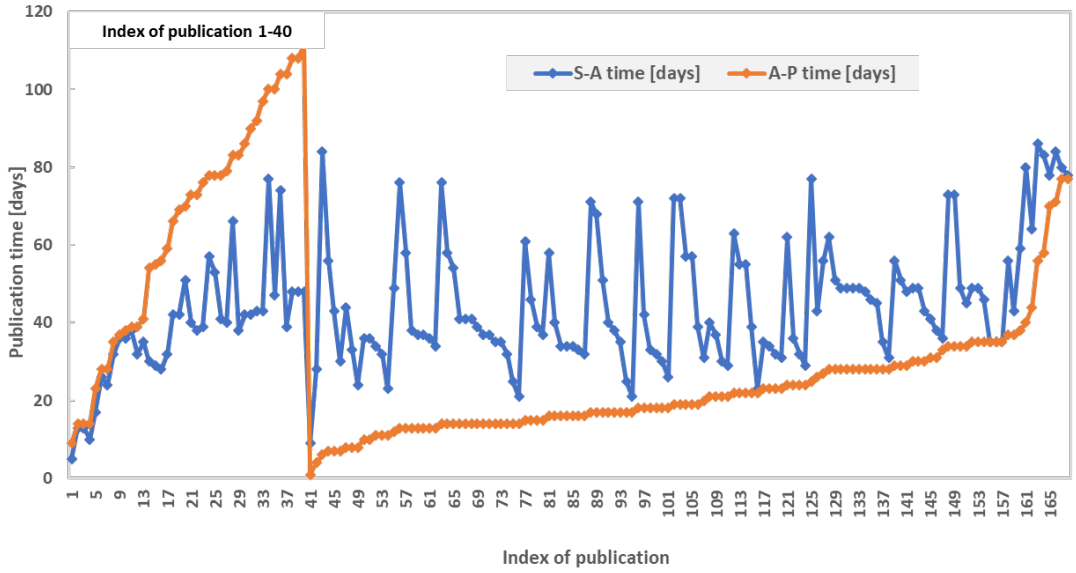

Figure 9: Publication time (submission-acceptance [S-A], acceptance-publication [A-P]) as a function of the index of publication in TASK Quarterly

Furthermore, it is worth adding that scientists from China, Greece and the United Kingdom also published a significant number of articles, (10-17). Interestingly, the first three countries from which authors published the greatest number of papers in *Task Quarterly* are high-income countries. Additionally, it is worth mentioning that if all the countries from which authors published their articles in TASK Quarterly are taken into account, it can be seen that 29 countries (65.9%) are high-income, 5 countries are upper middle-income (11.4%), 2 countries are low income (4.5%) and 7 countries are lower middle income (15.9%). Finally, at this point, it is worth highlighting that authors who come from high-income countries published 802 papers in TASK Quarterly, which represents 89.6% of all the published papers.

From the publisher's point of view, it is interesting to know which publications received the greatest number of citations. Hence, **Tab. 3** shows the number of publications, the number of citations and the number of citations per publication for countries from which authors

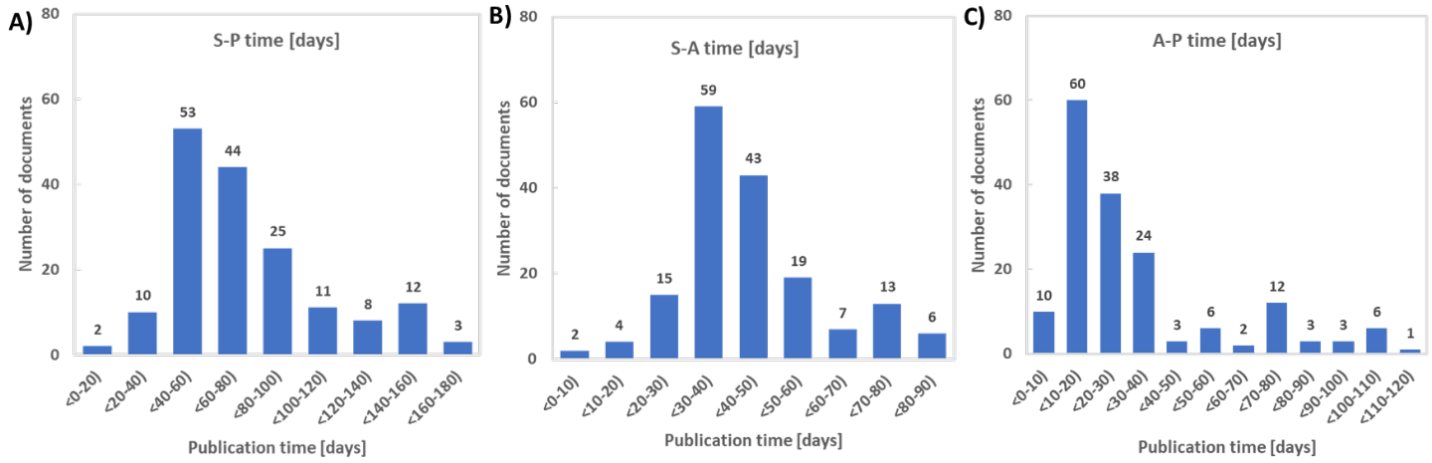

Figure 10: The number of publications as a function of the **(A)** S-P, **(B)** S-A, **(C)** A-P time

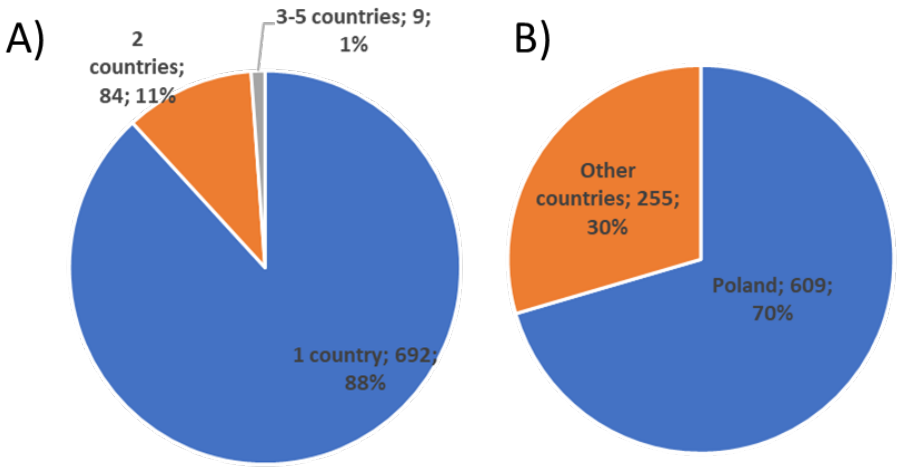

Figure 11: **(A)** The number of papers published in TASK Quarterly by authors from 1, 2 and 3-5 countries. **(B)** The number of papers published by Polish and international authors

published at least 4 papers in *Task* Quarterly in the years 1997-2021. At this point, it is worth noting that articles published by authors from these countries represent 95% of all the papers published in TASK Quarterly. According to **Tab. 3**, it can be seen that the greatest number of citations were from papers published by authors from Poland (2178), Germany (308) and Italy (218), while the greatest number of citations per publication were from papers published by scientists from Belgium (29.0), Czech Republic (14.7) and the United Kingdom (12.0). Interestingly, the number of citations per publication for countries with authors who published the greatest number of papers (>=25) in TASK Quarterly was in the range of 3.1-9.1.

If the number of publications per million inhabitants is taken into account, it can be seen that Poland is also the most productive and influential country in TASK Quarterly. Under this perspective, the second and third positions are taken by Malta and Greece, respectively. The number of publications, citations and citations per publication were calculated for countries which published their contributions (articles, reviews, book chapters) in

Table 3: Top 16 countries of authors who published the greatest number of papers in TASK Quarterly

ID	Affiliation country	TP	TC	TC/TP	TP/INH
1	Poland	60	217	3.6	16.1
2	Italy	52	218	4.2	0.9
3	Germany	34	308	9.1	0.4
4	Ukraine	32	155	4.8	0.7
5	USA	26	99	3.8	0.1
6	Russia	25	77	3.1	0.2
7	China	17	82	4.8	0.0
8	Greece	11	9	0.8	1.0
9	United Kingdom	10	120	12.0	0.1
10	Czech Republic	7	103	14.7	0.7
11	Austria	6	18	3.0	0.7
12	Malta	5	9	1.8	9.7
13	Belgium	4	116	29.0	0.3
14	Canada	4	33	8.3	0.1
15	France	4	32	8.0	0.1
16	Bulgaria	4	6	1.5	0.6

Task Quarterly in collaboration with scientists from Poland to estimate the effect of international collabo-

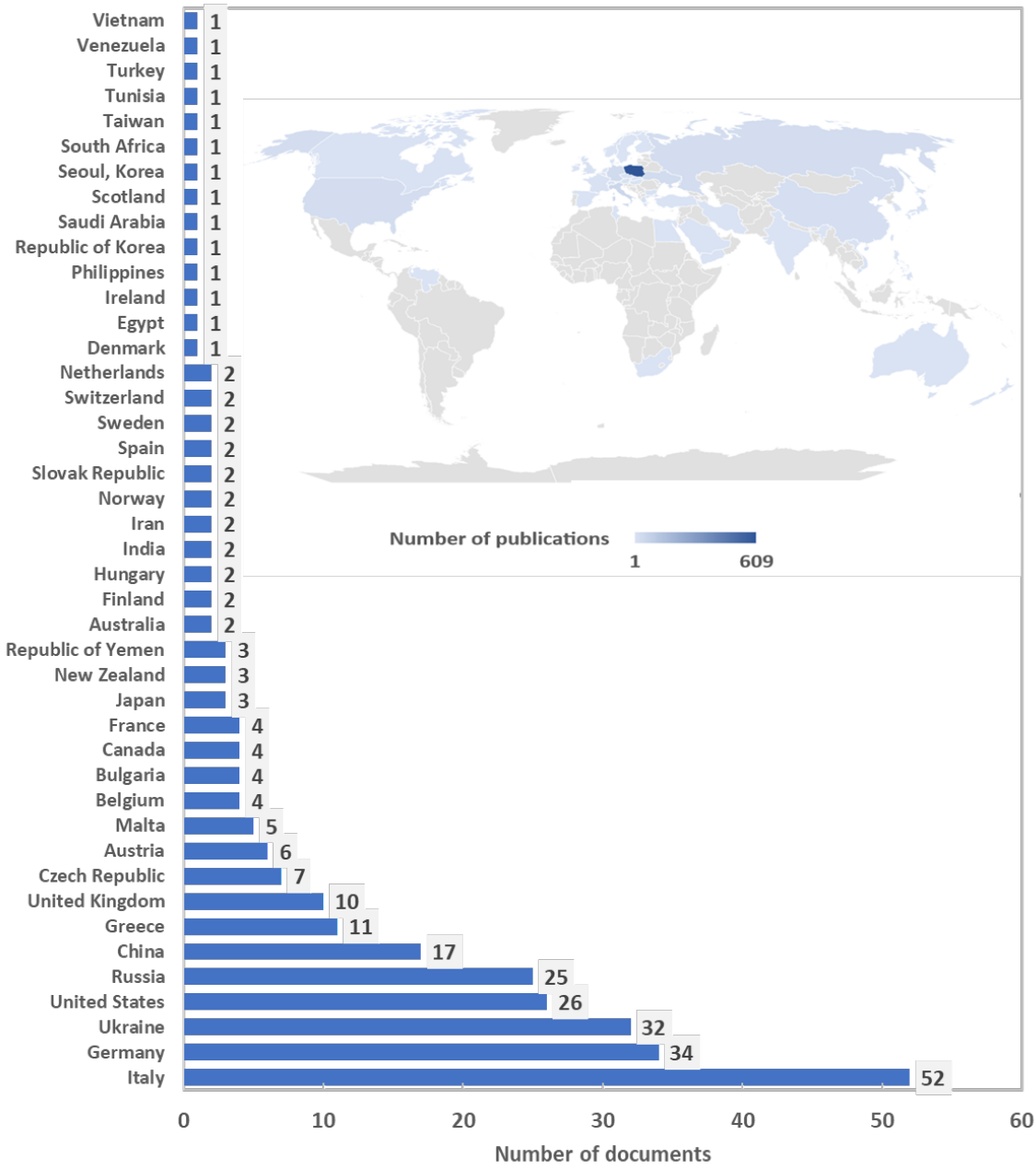

Figure 12: Countries from which authors published their articles in TASK Quarterly. Poland only – the country from which authors published the greatest number of articles in TASK Quarterly is shown in the world map

ration on the greater number of citations. As depicted in **Tab. 4**, papers published by scientists from Poland and scientists from USA, Ukraine, Japan and Germany had a greater number of citations per publication than papers published by Polish scientists only. It means that collaboration with these countries is very beneficial for scientists from Poland. However, when the average values of this indicator are compared, it can be seen that contributions published by Polish scientists had a slightly greater number of citations per publication (TC/TP=3.8) than papers published by scientists from Poland and other countries jointly (TC/TP=3.7). Additionally, it is worth adding that publications of scientists from other countries (excluding scientists from Poland) had the average number of citations per publication equal to 7.5. Based on these findings, it can be claimed that the number of citations depended on the author's nationality.

Table 4: Countries which published articles in TASK Quarterly in collaboration with scientists from Poland

ID	Affiliation country	TC	TP	TC/TP
1	Poland; USA	59	8	7.4
2	Poland; Ukraine	90	15	6.0
3	Poland; Japan	4	1	4.0
4	Poland; Germany	31	8	3.9

This analysis was performed also on an institutional level to obtain a more detailed picture. The Gdańsk Uni-

versity of Technology was selected,

This analysis was performed also on an institutional level to obtain a more detailed picture. The Gdańsk University of Technology was selected, as scientists from this university published the greatest number of papers in TASK Quarterly (**Tab. 5**). In particular, it is shown that publications by scientists from the Gdańsk University and Technology in collaboration with scientists from Italy and Sweden had a greater number of citations per publication than articles published by scientists from the Gdańsk University and Technology alone. Based on these findings, it can be claimed that international collaboration can have an effect on a greater number of citations per publication.

Table 5: Countries which published papers in *Task Quarterly* in collaboration with scientists from the Gdańsk University of Technology

ID	Country	TC	TP	TC/TP
1	Poland; Italy	25	7	3.6
2	Poland; Sweden	2	1	2.0
3	Poland	127	83	1.5
4	Poland; Germany	0	1	0.0

3.8. Insights into institutions publishing most frequently in *Task Quarterly*

Tab. 6 shows universities from which authors published at least 10 articles in TASK Quarterly in the years 1997-2021 to obtain a more detailed overview about institutions/universities. At this point, it is worth mentioning that a significant number of other types of contributions, such as: editorial materials, introductions, obituaries do not have information about the author's institution, and hence, these publications were excluded from analysis. According to **Tab. 6**, it can be seen that the greatest number of articles (237) in *Task Quarterly* were published by scientists from the Gdańsk University of Technology. The second position in terms of the greatest number of publications is taken by the Polish Academy of Sciences (109), while the third position is held by the AGH University of Science and Technology (38). Interestingly, 4 universities from other countries, such as: Italy, Russia, China and Germany can be found among universities from which authors published at least 10 papers. Moreover, **Tab. 6** presents that it was the Wrocław University of Technology (15.0) that had the greatest number of citations per publication, followed by the University of Karlsruhe (12.1) and the Silesian University of Technology (8.1).

Such information was also downloaded from online websites (21, 22) to estimate the positions of top 14 universities in the world university rankings, such as: ARWU (Academic Ranking of World Universities) and QS World University Ranking. It is worth noting that universities are assessed across various categories. For example, the QS World University Ranking includes the following indicators: academic and employer reputation, faculty/student ratio and research citations, while the ARWU ranking assesses universities in terms of the quality of education (the number of scientists who are Nobel Prize winners or and Fields Medal holders), the quality of the faculty (staff members who are Nobel Prize winners or and Fields Medal holders, the number of often cited researchers), the research output (the number of papers published in *Nature and Science*, the number of articles which were indexed in the Science Citation Index-Expanded and the Social Science Citation Index), the *per capita* performance (the weighted scores of the above five indicators divided by the number of full-time equivalent academic staff). As seen in **Tab. 6**, some universities from which authors published their papers in TASK Quarterly have very high positions in the ARWU and QS rankings.

In particular, the University of Karlsruhe held the 141st position in the QS ranking, while the University of Warsaw took the 284th place in the QS ranking. If the positions in the ARWU rankings are taken into account, it can be seen that the Huazhong University of Science and Technology held positions in the range of 101-150. Detailed information about the positions taken by the other top 14 universities in the ARWU and QS rankings is shown in **Tab. 6**.

3.9. Insights into the famous scientists who published in TASK Quarterly.

Andrzej Januszajtis, Piotr Doerffer, Sergey Leble, Leonardo Pasini, Andrzej Ambroziak and Jarosław Rybicki published the greatest number of articles and reviews (>=13) in TASK Quarterly in the years 1997-2021.

3.10. Insights into the most frequently used keywords in *Task Quarterly*

The VOSviewer software [23, 24] was used to estimate the keywords most frequently used in the articles published in TASK Quarterly in the years 1997-2021. The nodes represent the authors' keywords, while the size of the nodes means the number of publications featuring the node. Interestingly, the distance between the nodes represents the relationship between the nodes and the color of the node is the cluster to which the node has been assigned. At this point, it is worth adding that a greater number of lines between keywords means a stronger relationship between them. As seen in **Fig. 13**, keywords

Table 6: Institutions from which authors published the greatest number of articles in TASK Quarterly

ID	Name of institution	TP	TC	TC/TP	Country	ARWU (21)	QS (22)
1	Gdańsk University of Technology	273	634	2.7	Poland	801-900	801-1000
2	Polish Academy of Sciences	109	514	4.7	Poland	-	-
3	AGH University of Science and Technology	38	143	3.8	Poland	701-800	801-1000
4	University of Camerino	34	171	5.0	Italy	-	-
5	Immanuel Kant Baltic Federal University	22	44	2.0	Russia	-	601-650
6	University of Gdansk	22	54	2.5	Poland	-	801-1000
7	Silesian University of Technology	19	154	8.1	Poland	-	1001-1200
8	Warsaw University of Technology	16	82	5.1	Poland	901-1000	521-530
9	Częstochowa University of Technology	14	107	7.6	Poland	-	-
10	Lublin University of Technology	13	37	2.8	Poland	-	1001-1200
11	University of Warsaw	12	20	1.7	Poland	401-500	284
12	Wrocław University of Technology	12	180	15.0	Poland	901-1000	801-1000
13	Huazhong University of Science and Technology	10	26	2.6	China	101-150	306
14	University of Karlsruhe	10	121	12.1	Germany	201-300	141

are divided into 3 clusters. In particular, the first cluster (red) contains 286 items, the second cluster (green) contains 142 items, while the third cluster (blue) contains 111 items. Furthermore, it can be seen that the red cluster represents keywords related to molecular dynamics, computer simulation, the finite element method, while the blue cluster represents keywords associated with the Navier-Stokes equation, turbomachinery, experiments and the CFD method. On the other hand, it is worth noting that the green cluster is also devoted to physical concepts, such as: the Boltzmann equation, scattering, the finite volume method, numerical simulation and heat transfer. Based on **Fig. 13** and **Tab. 7**, it is worth noting that the CFD, molecular dynamics and the finite element method (FEM) are the most frequently used keywords in publications in TASK Quarterly. They have a very high occurrence frequency (28, 23 and 17, respectively). The author's analyses show that although papers published in TASK Quarterly are mainly associated with physical and computer sciences, *Task Quarterly* also publishes materials devoted to other sciences, such as: medicine and biophysics. For example, analysis of keywords shows that publications very often focus on concepts related to the drug design, compounds (i.e. phenylalanine), protein folding, anti-tumor agents. However, at this point, it is worth mentioning that the author's analyses have several limitations, such as: the lack of keywords in some articles, the author's keywords are not often comprehensive and accurate enough to summarize the publication content.

3.11. Insights into journals citing TASK Quarterly publications most frequently

Tab. 8 presents a list of top 20 journals citing *Task Quarterly* publications most frequently. In particular, it can be seen that it is TASK Quarterly that had the greatest number of citing publications (121). Moreover, it is worth noting that these self-citations represent 3.5% of all citations in *Task Quarterly*. The second position in terms of the greatest number of citing TASK Quarterly publications is held by the *Journal of Turbomachinery* (25), while the third position is taken by *Transactions of the Institute of Fluid-Flow Machinery* (21). A detailed information about other top 20 journals citing *Task Quarterly* publications can be found in **Tab. 8**. Additionally, at this point, it is worth mentioning that other types of publications, such as: PhD/master theses, books, proceedings, papers also citing TASK Quarterly.

Table 7: 10 keywords most frequently used in TASK Quarterly articles between 1997 and 2021

Rank	Keywords	Occurrences
1	CFD	28
2	molecular dynamics	23
3	finite element method	17
4	FEM	17
5	numerical simulation	11
6	turbomachinery	11
7	silo	8
8	shock wave	8
9	turbulence	7
10	queuing networks	7

3.12. Comparison of TASK Quarterly with other journals which published contributions on similar topics

A detailed analysis of TASK Quarterly in comparison with other scientific journals is shown in **Tab. 9**. In particular, it can be seen that 7 journals are Open Access, while 3 journals are hybrid. Moreover, **Tab. 9** shows that TASK Quarterly is the oldest journal, second to *International Journal of Applied Mathematics and Computer Science*. Analysis of the objectives and scope of selected jour-

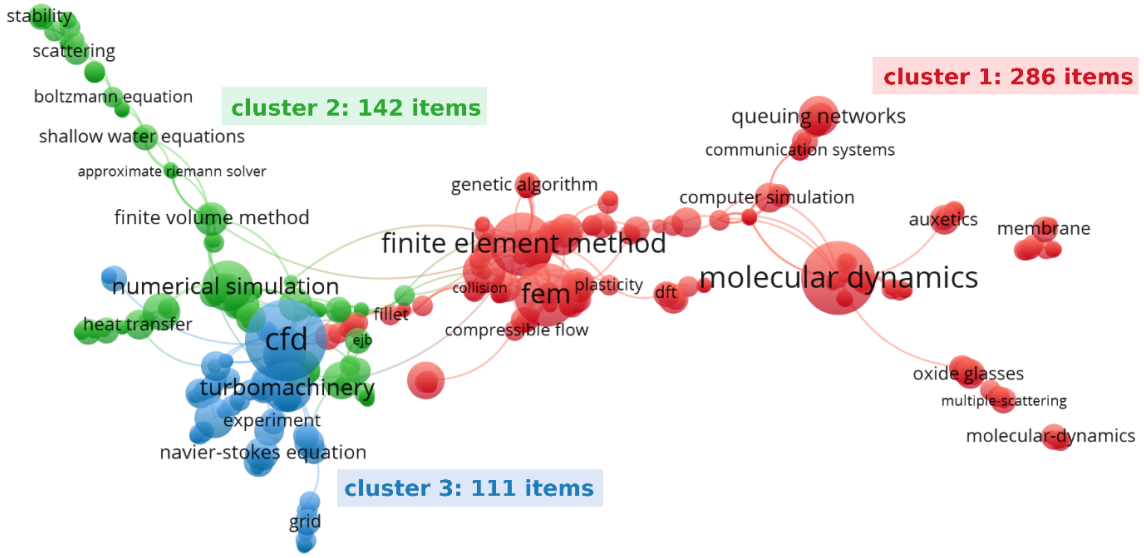

Figure 13: Keywords most frequently used in TASK Quarterly

Table 8: Top 20 journals citing TASK Quarterly publications most frequently

ID	Journal	Number of publications
1	TASK Quarterly	121
2	Journal of Turbomachinery	25
3	Transactions of the Institute of Fluid-Flow Machinery	21
4	Journal of Thermal Science	19
5	Journal of Non-crystalline Solids	18
6	Zeszyty Naukowe. Cieplne Maszyny Przepływowe-Turbomachinery/Politechnika Łódzka	16
7	Journal of Theoretical and Applied Mechanics	16
8	Energies	16
9	Bulletin of the Institute of Fluid-Flow Machinery	15
10	Powder Technology	15
11	Polish Maritime Research	14
12	Physical Review E	13
13	Granular Matter	13
14	Physical Review B	12
15	Autobusy: technika, eksploatacja, systemy transportowe	12
16	Proceedings of the Institution of Mechanical Engineers, Part A: Journal of Power and Energy	11
17	Journal of Fluids Engineering	11
18	Chemical and Process Engineering	11
19	Procedia Engineering	10
20	Chemical Engineering Science	10

nals shows that these journals are also related to mathematics, physical and computer sciences (artificial intelligence, IT systems, theory and methods).

On the other hand, if the number of citations per publication is taken into account, it can be seen that 4 journals have a slightly smaller number of citations per publication than TASK Quarterly. Furthermore, TASK Quarterly has slightly smaller percentage of publications cited at least once (59.33%) than other selected journals (68.70-92.75%), excluding *Science Progress* (56.54%).

The next important factor are article processing charges (APC). A comparison of TASK Quarterly with other selected journals reveals that 3 journals, including TASK Quarterly do not charge any fees. This information can be useful for potential authors who want to publish their articles in TASK Quarterly, because it is well known that scientists prefer journals without article processing charges. Unfortunately, if all journals are compared in terms of the Impact Factor, it can be seen that it is only TASK Quarterly that does not have the Impact Factor. According to **Tab. 9**, it can be also seen that *PeerJ Computer Science* and TASK Quarterly published a similar number of articles. The author's analyses show that TASK Quarterly is an emerging scientific journal in the field of physical and computer science with high perspectives to be indexed in the Journal Citation Reports (JCR) of the Web of Science (WoS) Core Collection database. However, publishers and editors should encourage scientists from all the world to publish their articles in this journal. Moreover, articles in TASK Quarterly should be cited more frequently, while the publication time should be short, because it is well known that scientists want to publish their articles fast.

4. Summary

This work presents insights into the papers published in *Task Quarterly* in the years 1997-2021 indicating an in-

Table 9: Comparison of TASK Quarterly with other selected journals devoted to similar topics. **% Cited** - % publications cited at least one; **Year** – year of first published issue; **Model** – model of journal; **H-** hybrid; **D**- APC depends on the domestic/foreign authors and number of pages

ID	Name	Publisher	TC/TP	2021 JIF	JIF Quartile	% Cited	APC [Euro]	Year	Model	TP
1	IJAMCS	University of Zielona Góra	11.45	2.157	Q1	92.75	D	1991	OA	979
2	PJCS	Peer J Inc	8.11	2.411	Q2	71.11	1410	2013	OA	803
3	**TQ**	**Gdansk University of Technology**	**4.66**			**59.33**	**0**	**1997**	**OA**	**750**
4	SP	SAGE Publications	2.86	1.512	Q3	56.54	2126	1999	OA	566
5	FF	MDPI	3.37	3.577	Q1	87.04	1855	2017	OA	275
6	AMP	Springer	3.79	1.570	Q1	69.59	2090	2011	HT	169
7	BDR	Elsevier	7.87	3.739	Q2	81.57	2529	2014	H	94
8	ME	AIMS Press	2.51	1.333	Q4	68.70	0	2019	OA	65
9	RMS	Springer	6.72	1.824	Q1	74.01	3390	2014	HT	61
10	SIAM	SIAM Publications	6.38	3.921	Q1	76.56	0	2019	OA	52

creasing trend in the number of publications and citations over the period of 25 years. A significant increase in the number of publications in *Task Quarterly* can be explained by the huge interest in the topics related to mathematics, physical and computer sciences in the selected years. As revealed by the analysis, 57% of all publications in *Task Quarterly* had at least one citation, while the average number of citations per publications was 4.5. Interestingly, 81 papers published in TASK Quarterly had more than 10 citations, including 2 papers which had more than 100 citations. Furthermore, it is worth noting that the greatest number of cited TASK Quarterly publications are in the *Journal of Turbomachinery* (25) and *Transactions of the Institute of Fluid-Flow Machinery* (21), excluding self-citations which represent 3.5% of all the citations. Although, the greatest number of publications (37%) were written by 1 author, the average number of authors per publication in TASK Quarterly is 2. The greatest number of publications in TASK Quarterly contain 10 pages, while the average number of pages per publication is 14. Moreover, it is worth noting that 61% of all publications contain equations, and 91% of all the publications have at least one reference.

The average number of equations per one publications in *Task Quarterly* is 13, while the average number of references is 18. Therefore, the author's study considers contributions which were published in the years 2015-2021 that have information about the publication time. These publications represent 21% of all the contributions published in TASK Quarterly in the years 1997-2021. On the other hand, the publications in the years 1997-2014 do not contain any information about the publication time or contain only information about received and/or revised publication dates. The average publication time for papers published in TASK Quarterly is 77 days, including the average S-A time (44 days) and the average A-P time (33 days). 74% of all papers with information about the publication time have the S-A time longer than the A-P time. Surprisingly, the longest publication time is 178 days, while the shortest publication time is 10 days. 88% of all the contributions were written by authors from 1 country, while 68% were published by authors who come from Poland only. An analysis of the top countries and institutions in terms of the greatest number of publications in TASK Quarterly shows a strong impact of the journal among scientists from all over the world. In particular, it has been found that Poland is top-ranked, providing 609 articles, with Italy (52 articles) and Germany (34 articles) sharing the podium. The first six positions are completed by Ukraine, USA and Russia (32, 26 and 25 articles, respectively). Articles which were published by these countries had the number of citations per publication in the range of 3.1-9.1. On the other hand, if only countries from which authors published at least 4 articles in TASK Quarterly in the years 1997-2021 are taken into account, it is found that the greatest number of citations pertains to contributions published by authors from Poland (2178), Germany (308) and Italy (218), while the greatest number of citations per publication is found in publications by authors from Belgium (29.0), Czech Republic (14.7) and United Kingdom (12.0). The results show that international collaboration can have an effect on a greater number of citations per publication. Interestingly, authors who come from high income countries published 89.6% of all contributions in TASK Quarterly.

Additionally, the results show that the greatest number of articles in TASK Quarterly were published by scientists from the Gdańsk University of Technology (237), followed by the Polish Academy of Sciences (109), the AGH University of Science and Technology (38). In the case of universities from which authors published at least 10 papers in TASK Quarterly, the greatest number of citations per publication was achieved by the Wrocław University of Technology (15.0), followed by the University of Karlsruhe (12.1) and the Silesian University of Technology (8.1). The author's analyses also show that CFD, molecular

dynamics, the finite element method (FEM) and numerical simulations are the most frequently used keywords in the publications of TASK Quarterly. Based on the author's findings, it can be claimed that although articles published in TASK Quarterly are mainly associated with physical and computer sciences (technical IT and telecommunications as well as automation, electronics and electrical engineering), the journal also published papers associated with other sciences, such as: biomedical engineering, biophysics and mathematics.

Finally, it is worth adding that a comparison of TASK Quarterly with other selected journals shows that some journals which were indexed in the Journal Citation Reports (JCR) have a slightly smaller number of citations per publication and the percentage of publications cited at least once, and hence, it can be claimed that TASK Quarterly has a chance to be indexed in the Journal Citation Reports (JCR) of the Web of the Science (WoS) Core Collection database.

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