

Current Publications on Geodesy in Russia

Alexander P. KARPIK and Vladimir A. SEREDOVICH, Russian Federation

Key words: geodesy, publication, analysis.

SUMMARY

The analysis of publications on geodesy issued in academic periodicals in Russia for the previous years is given.

SUMMARY

В докладе выполнен анализ публикаций по геодезии за последние годы в журналах, издаваемых в России.

Current Publications on Geodesy in Russia

Alexander P. KARPIK and Vladimir A. SEREDOVICH, Russian Federation

The research activity in the field of geodesy in Russian always plays a significant role in geosciences. Fundamental and applied scientific studies in geodesy/surveying are of a great importance for geosciences. The results of research activity are published in academic periodicals, monographs and proceedings of conferences. In the last few years publications are increasingly appeared more and more in electronic form and they are available in the Internet.

In the last few decades a research activity in geodesy has been dynamically growing. It is caused by such factors as the appearance of new methods of observations and improvement of old ones as well as a development on their basis new instruments, techniques and technologies

An active development of GIS technologies allowed the new processing methods of geodetic observations to be developed, increasing the efficiency of data modelling and interpretation.

The advancement of progressive and updating existing processing methods of geodetic observations make it possible to use the obtained results more effectively.

Owing to active development of GPS technologies, GIS technologies, digital processing procedures of geodetic observations, and high-volume 3D modelling using both the results of airborne and terrestrial scanning a great step forward has been done in the field of geodesy

The above-listed factors make the separation of geodesy, geoinformation, cartography, and cadastre from each other more complicated. An active integration of these areas is observed. It is possible that this problem will be solved in the nearest future from the position of new interdisciplinary approaches.

In our case we tried to analyze new publications on geodesy in Russia for the previous two years from the point of traditional approaches and on their basis to make a conclusion about the state and progress in the field of geodesy.

The analysis of scientific publications on geodesy has allowed following up implementation dynamics of research activities in this field, revealing more actual areas, and evaluating the most significant achievements.

Publications of the results of research activities in Russia are carried out through the bulletins, proceedings of scientific and technical conferences, popular editions, and electronic means of the Internet.

Undoubtedly, the abstract journal “Geodeziia i aerofotos’emka” (Geodesy and Aerial Photography) is an information leader of scientific editions in Russia. It has the following list of classification headings:

General information

- History of geodesy and cartography. Personalia
- Scientific and technical societies. Forums, congresses, conferences, symposiums, workshops, and exhibitions
- International cooperation
- Management of research activity
- Information activity
- Terminology. Reference and academic books
- Standardization
- Economics, organization, management, planning, forecasting activity
- Personnel
- Legal matters

Theoretical geodesy

- Spatio-temporal reference systems in geodesy
- Physical geodesy
- Spheroid geodesy and space geodesy

Fundamental onshore surveying works

Marine geodesy

Astrogeodesy

Gravimetry

- Determination of gravity constant
- Gravity measurements

Space geodesy

- Utilization of Earth satellites in geodesy/surveying
- Use of radio astronomical observations for surveying purposes

Surveying procedures for solution of geodynamic problems

- Analysis of planetary geodynamic phenomena
- Study of the recent Earth's crust motions

Topography. Phototopography

- Control network densification
- Onshore topographic mapping
- Aerial surveys in generation of topographical maps
- Offshore mapping
- Photogrammetry
- Topographic interpretation
- Topographic and special-purpose maps and plans. Digital terrain models (DTMs)
- Compilation, editing and preparation of maps and plans for publication
- Use of aerial and space information in compiling and updating of topographic and special-purpose maps
- Automation of medium- and large-scale mapping and digital terrain models (DTMs)

Applied geodesy. Applied application of aerial photography and photogrammetry
Application of geodesy, aerial photography, and photogrammetry in construction
Application of geodesy, aerial photography, and photogrammetry in transport
Application of geodesy, aerial photography, and photogrammetry in mineral deposit exploration
Special aerial surveys
Application of geodesy, aerial photography, and photogrammetry in land anagement, water management and natural resources management
Application of geodesy, aerial photography, and photogrammetry in architecture, archeology and medicine
Application of geodesy, aerial photography, and photogrammetry in other branches of national economy
Mathematical processing of geodetic observations
Theory of errors and least-square method. Mathematical-statistical methods in geodesy/surveying
Adjustment of networks
Surveying problem-oriented programming. Computing machines
Storage devices for geodetic information
Surveying instruments, their testing

By now some classification headings are perhaps out of date, some have to be added, and it is quite natural. According to the opinion of experts only the most significant publications are given in this abstract journal. Thus, these publications reflect not only quantitative but also qualitative reliability.

As a result of detailed analysis of all issues of the abstract journal for 2006, the classification heading “General information”, consisting of history of geodesy and cartography, scientific and technical societies, congresses, conferences, symposiums, seminars, exhibitions, international cooperation, management of research activity, information activity, etc., includes the abstracts for 237 publications.

84 abstracts are given in the classification heading “Theoretical geodesy”. It points to the fact that a research-and-development activity can be considered today as actual. The problems of space geodesy and surveying procedures for solution of geodynamic problems are also urgent. Each of them includes more than 60 abstracts.

Traditionally a major activity of scientific researches, owing to their intensive use, is demonstrated in classification headings “Topography” and “Applied geodesy”. They include 133 and 194 abstracts respectively. A lot of scientists in Russia deal with mathematical processing of geodetic observations. More than 100 abstracts are published in this heading.

It is necessary to mention, that these abstracts reflect a period of last two-three years. Comparing a dynamics of publications for the period of 2005-2006, we have revealed that only for a year the number of abstracts was increased more than by 40 %.

In last few years a scientific activity in Russia has been drastically increased. This is due to the fact that new scientific magazines and holding conferences were appeared. According to the results of the International Exhibition and Scientific Congress “GEO-SIBERIA” the volume of publications for the last two years has increased and its number exceeded 800. A similar tendency is characterized for all scientific congresses. Therefore, it can be confirmed with certainty that this tendency will be kept in the future.

Analyzing the above-mentioned, it is possible to say that a level of scientific publications and researches without any doubts is steadily increased. In its turn, it will lead to the increase of numbers of defended scientific theses and the appearance of scientific monographs.

In Russia not quite all academic magazines are abstracted in public editions, but only those whose rating is rather high. Today about 110 academic magazines are abstracted and among them are the well-known surveying magazines, namely, “Geodeziia i kartografiia” (Surveying and Mapping) issued by the Federal Service of Geodesy and Cartography of Russia (“Roskartographia”) and “Izvestiia VUZov. Geodezia i aerofotos’emka” (Proceedings. Geodesy and Aerial Photography) issued by Moscow State University of Geodesy and Cartography (MIIGAiK), which will celebrate its 228th anniversary this year.

Most numerous scientific publications on geodesy/surveying are given in the following academic magazines:

1. “Geodeziia i kartografiia” (Surveying and Mapping) issued by the Federal Service of Geodesy and Cartography of Russia (www.roskart.gov.ru)
2. “Geodezist” issued by the National Cartographic Corporation (www.patris.ru/company.html/)
3. “Izvestiia VUZov. Geodezia i aerofotos’emka” (Higher School Bulletin. Geodesy and Aerial Photography) issued by Moscow State University of Geodesy and Cartography (MIIGAiK) –(www.miigaik.ru)
4. “Aviakosmicheskoe priborostroenie” (Aerospace Instrument Making), Moscow, Publishing house “Nauchtehlitizdat”
5. “Avtomatizirovannye tekhnologii izyskanij i proektirovaniia” (Automated Technologies for Surveying and Designing) issued by the Scientific and Industrial Company “Credo-Dialogue” (Minsk) (www.credo-dialogue.com/publication/publication_3.html/)
6. “Vestnik Moskovskogo gosudarstvennogo universiteta” issued by the Moscow State University (www./msu.ru)
7. “Vestnik Sibirskoi gosudarstvennoi geodezicheskoi akademii” issued by Siberian State Academy of Geodesy (www.ssga.ru)
8. “Geoprofi”, a scientific and technical edition on surveying, mapping and navigation (www.geoprofi.ru)

9. "Zemlia i vseleennaia" (The Earth and the Universe), a popular science edition of the Russian Academy of Sciences and the Society of Astronomy and Geodesy (www.ziv.telescopes.ru)
10. "Issledovaniia Zemli iz kosmosa" (Earth Research from Space) issued by MAIK Nauka/Interperiodica, which was established by the Russian Academy of Sciences and Pleiades Publishing, Inc. (www.maik.ru)
11. "Novosti kosmonavtiki" (News of Astronautics) (www.novosti-kosmonavtiki.ru)
12. "Trudy IPA RAN" (Proceedings of the Institute of Applied Astronomy, the Russian Academy of Sciences), www.ipa.nw.ru/PAGE/EDITION/transaction.html/
13. "Information Bulletin" of GIS-Association (www.gisa.ru/ib.html/)

According to the results of scientific conferences actual proceedings are published. Most publications on geodesy/surveying are the results of the following conferences:

1. "Saint Petersburg International Conference on Integrated Navigation systems" organized by the State Research Center of Russia - Central Scientific & Research Institute "Elektropribor", www.elektropribor.spb.ru/cnf/icins06/enfrset.html/
2. "International Aerospace Congress" dedicated to the 100th anniversary of aeronautics.
3. "Remote Sensing of Ground Covers and Atmosphere by Aerospace Facilities" organized on the basis of the Russian State Hydrometeorological University (RSHU), www.ras.ru/sntactions/2004/action.aspx/, www.rshu.ru
4. The International Scientific and Industrial Forum "Great Rivers", [/www.unesco.nngasu.ru/](http://www.unesco.nngasu.ru/), [/www.nngasu.ru/indexeng.php/](http://www.nngasu.ru/indexeng.php/)
5. "Modern Problems on Geodesy and Optics" organized by Siberian State Academy of Geodesy (www.ssga.ru)
6. "The International Exhibition and the Congress "GEO-Siberia" organized by the Siberian Fair and Siberian State Academy of Geodesy, www.geosiberia.ssga.ru, www.geosiberia.sibfair.ru
7. "Contemporary Problems of Information Technologies and Satellite Monitoring", www.iki.rssi.ru/eng/index.htm/
8. "The International Forum on Problems of Science, Technology and Education" organized by the Russian Academy of Geosciences (see: www.mii.gaik.ru)
9. "The Fourth All-Russian Open Science Conference on Earth Observations from Space" organized by the Space Research Institute of the Russian Academy of Sciences, etc

Nowadays a variety of research-and-production and private editions have appeared. Most progressive and dynamically developing among them are "Information Bulletin" of GIS-Association (www.gisa.ru/ib.html/), "Geoprofi" (www.geoprofi.ru), "Geodezist" (www.patris.ru/company.html/), "Spatial Data" (www.gisa.ru/pd.html), "Geoinformation" (www.geosys.ru/pages/cenisd.html/), and "Avtomatizirovannye tekhnologii izyskanij i

proektirovaniia” (Automated Technologies for Surveying and Designing) (see: http://www.credo-dialogue.com/publication/publication_3.html/), etc.

Of special interest today is the availability of electronic editions in the Internet. Among them it should be mentioned the following electronic versions of magazines: ”Information Bulletin” of GIS-Association (www.gisa.ru/ib.html/), ”Geoprofi”, (www.geoprofi.ru), and ”Trudy IPA RAN” (Proceedings of the Institute of Applied Astronomy, the Russian Academy of Sciences, see: www.ipa.nw.ru/PAGE/EDITION/transaction.html/)

Company ”GEOKOSMOS” pursues an active policy in the field of publications on laser scanning (www.geokosmos.ru). Currently the activity of some scientific schools as well as the Russian leading scientists has sufficiently increased. It was manifested by publication of a variety of fundamental monographs.

Thereby, summarizing our review, it may be concluded that:

1. There is an effective system in Russia actively used to publish the results of research activities in general and in the field of geodesy in particular.
2. The most meaningful magazines (about 100) and proceedings of conferences (about 150) are abstracted in the abstract journal Geodeziia i aerofotos'emka” (Geodesy and Aerial Photography). Abstracts of most popular foreign editions including papers on geodesy/surveying can be found in above mentioned journal, among which is Allgemeine Vermessungs-Nachrichten, Geodeticky a Kartograficky Obzor, GIM International, IEEE Transactions. Geoscience and Remote Sensing, ISPRS Journal of Photogrammetry and Remote Sensing, Navigation (France), Geodezja i Kartografia, Bulletin of the Society of Cartographers, Zeitschrift fuer Photogrammetrie und Fernerkundung, Zeitschrift für Vermessungswesen, Vermessungsingenieur, Nachrichten aus dem Karten- und Vermessungswesen, Geodézia és kartográfia, Bulletin géodésique, Zeitschrift für Vermessungswesen: Z. Geodäsie, Geoinformation und Landmanagement, etc.
3. It should be mentioned that there is a tendency has been toward the increase of publications on geodesy/surveying in scientific periodicals and actual proceedings of conferences as well.
4. Today satellite geodesy, geoinformation, photogrammetry and laser scanning are of significant interest.
5. Taking into account a rapid development of recent trends in geodesy, it is expected that in the nearest future there will appear new research-and-production editions on such priority directions as geodesy, cartography, optics, cadastres, geodynamics, remote sensing, geoinformation, natural resources management, and geocology.

In conclusion it is necessary to mention that the results of scientific publications on geodesy/surveying in Russia are not sufficiently reflected in the Internet editions.

To subscribe for some periodicals on geodesy, you may visit the site of “Science and production association” the Inform-system» (Subscription Agency and Booksellers “Inform-Systema”), which works with biggest libraries, universities, firms to provide them periodicals and books. “Inform-Systema” is a subscription agency and bookseller in Russia and abroad:
<http://www.informsystema.ru/shop/>

CONTACTS

Prof. Dr. Alexander P. Karpik
Rector of Siberian State Academy of Geodesy (SSGA)
Prof. Vladimir Seredovich
Vice-rector on Innovative Activity (SSGA), Vice-Chair of
WG6.3 – Engineering Survey Data Bases and Facility Management
10 Plakhotnogo Ul.
Novosibirsk, 630108
Russian Federation
Tel: + 7 383 343 39 37 343 39 57
Fax: + 7 383 344 30 60
Email: rektorat@ssga.ru, sva@ssga.ru
Web site: <http://www.ssga.ru>

: