

9. Qiao, L. et al. Effect of displacement damage due to heavy ion irradiation on deuterium retention in CLF-1 steel // Nuclear materials and energy. – Vol. 25, 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S2352179120300703> (date of access: 06.11.2020). – Text: online.

Н.Н. Зяблова, С.А. Мелконян
Национальный исследовательский
Томский политехнический университет

Formation of terminology in the fields of astronomy, nuclear physics and geology in modern English: structural aspect

The present article examines the formation of terminologies via the analysis of grammatical structure of terminological units in the scientific spheres such as astronomy, geology and nuclear physics in modern English. Grammatical analysis of terminological units of the abovementioned spheres has helped to identify common, less common and not common ways of formation.

Key words: terms; terminological units; English; grammatical structure; astronomy; geology; nuclear physics.

This article examines the formation of terminological systems in the topical scientific spheres (subject areas) such as astronomy, geology and nuclear physics in modern English. The linguistic analysis of the grammatical structure (part of speech) of terms and terminological units in scientific fields of astronomy, nuclear physics and geology in modern English has been carried out. Common, less common and not common methods of formation of terminologies in the specified subject areas have been identified which will enable us to predict the most and least popular ways of nominating special notions and objects of the abovementioned scientific spheres.

Research in such subject areas as astronomy, nuclear physics and geology is relevant: a large number of publications written by scientists from different countries that appear in scientific and technical journals are written in English. Today English is a means of international communication and exchange of experience and knowledge throughout the world. The exchange of information is carried out thanks to special vocabulary (terms and terminological units).

Terminological units are special lexical units that are used to designate special concepts and objects belonging to special subject areas. The use of terms and terminological units in scientific and technical publications arouses the interest of linguists and terminologists who study terminology in subject areas in order to identify the most common and less common methods of term

usage. Terminology science is connected with an Austrian scientist Eugen Wuster and a terminologist D. Lotte. O. S. Akhmanova, S. V. Grinev and V. A. Tatarinov are among well-known representatives of modern Russian terminology science.

A random sample of 60 terms and terminological units has been chosen from scientific and technical journals in the field of astronomy, nuclear physics and geology from 2019 to 2020 («Nuclear Physics A», «Geotextiles and Geomembranes», «Science of Planets and Space», «Science of Planets and Space», «Journal of Atmospheric and Solar-Terrestrial Physics», «Results in Physics») [2–8]. Terms and terminological units have been selected from scientific and technical journals based on the characteristics of term – the ability to nominate a special concept and objects, the absence of emotional coloring, the absence of polysemy, unambiguity within one subject area, motivation [1, pp. 48, 171]. The analysis of the grammatical (part of speech) structure of terms and terminological units has been carried out. The most common and less common structures used to nominate special concepts and objects have been revealed.

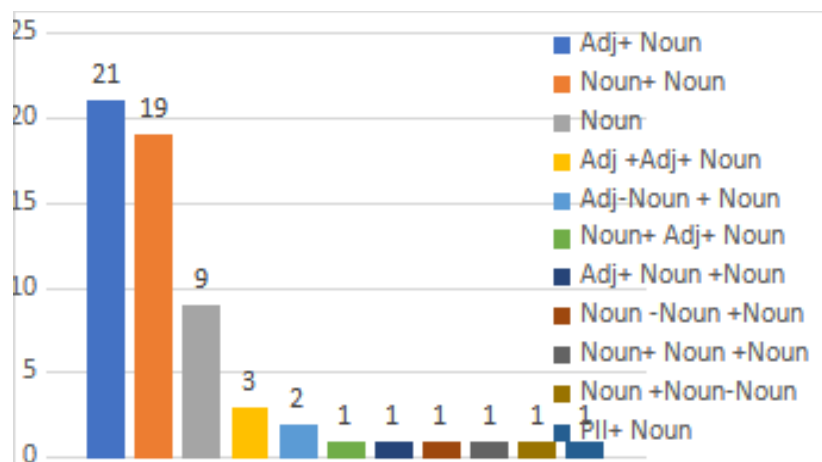


Fig. 1. Analysis of grammatical (part of speech) structure of English terms and terminological units in the field of nuclear physics, astronomy and geology

As a result of the analysis (Fig.1) the most common grammatical structures have been identified: *Adj + N* (*bulk properties, refractive index, quantum well, chromatic aberration, telecentric lens, heterogeneous reaction, Euclidean distance*) and *N + N* (*vapor intrusion, glass fiber, absorption bandwidth, Broglie hypothesis, Breakdown voltage, Hydrogen embrittlement, Phase modulator*). The number of these grammatical structures is equal to 21 and 19, respectively. Less common grammatical structures are represented by the fol-

lowing parts of speech: *N* (9 units) (*kaon, proton, microstructure, heterojunction, oscillation, geosynthetics*); *Adj + Adj + N* (3 units) (*convolutional neural network, Polar mesospheric clouds*). Hyphenation is also used for designation (2 units), e.g. *free-form mirrors* (*Adj-N + N*), *free-form optics* (*Adj-N + N*) and (*N + N-N*) (1 unit) *aerosol mass-spectrometry* and (*N-N + N*) (1 unit) *cation-exchange capacity*. The rest of the grammatical structures have been encountered once in this sample: *N + Adj + N* (*Duplex stainless steel*), *N + N + N* (*Van Allen Probes*), *Adj + N + N* (*finite element analysis*), *PII + N* (*aliased signals*). The sample also includes such terms and terminological units as *Brownfield sites* (*N + N*), *Angstrom exponent* (*N + N*), *Bessel function* (*N + N*). They contain names of researchers. This method of formation of terms, which consists of using a proper name instead of a common noun, is called *antonomazia* – a kind of metonymy, trope. In this sample they are mostly represented by the *N + N* structure, but there is an exception in the form of *Euclidean distance* with the *Adj + N* structure (they appear 6 times in the sample).

Thus, the most common grammatical way of nominating special concepts and objects in such subject areas as astronomy, nuclear physics, geology is adjectival and nominal. Adjectives and nouns are preferably used to modify nouns where in compounds consisting of nouns, nouns in pre-position to defined nouns can function as adjectives.

On the whole, there have been found the following part-of-speech combinations: *Adj* with *N*, and *N* with *N*. Less common ways are partial-speech combinations consisting of *N* in a semi-literal spelling with *N* plus *N*; *Adj*. in a semi-literal spelling with *N*; *N* with *N* plus *Adj* with *N*; *N* with *N* and *N*; *Adj* with *N* and with *N*; *PII* with *N*. Also, when nominating special concepts and objects, *antonomazia* is used.

Based on the data from a random sample, it can be assumed that the complication in the structure of terms leads to a decrease in the frequency of their use (2–3 uses per term). The complication of terminological combinations (large lexical length) is caused by the need for greater specificity in the name or a narrower focus in any of the branches of scientific activity. Thus, the term «*proton*» has a greater chance of being used in research works than the more complex term «*Polar mesospheric clouds*». It has been assumed that low frequency of such grammatical (part-of-speech) structures as the combination of the past participle with a noun and a verb in a given sample may be due to a lack of data (small sample size).

Further linguistic research of grammatical structure of terms and terminological units of the abovementioned scientific areas will be useful for standardization of their terminological systems and communication in the areas.

Литература

1. Grinev, S. V. Vvedenie v terminovedenie / S. V. Grinev. – Moscow : Moskov. licej, 1993. – 309 s.
2. Chen, Lu et al. Construction of freeform mirrors for an off-axis telecentric scanning system through multiple surfaces expansion and mixing // Results in Physics. – Vol. 19. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S2211379720318210> (date of access: 08.11.2020). – Text: online.
3. Di Battista, V. et al. TCE and PCE diffusion through five geomembranes including two coextruded with an EVOH layer // Planetary and Space Science. – Vol. 48. – Iss. 5. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S0266114420300388> (date of access: 06.11.2020). – Text: online.
4. Felemban, N. Initial nuclear effects in the improved HIJING code and the production of charged pions, kaons and (anti)protons at STAR BES // Nuclear Physics A. – Vol. 1003. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S0375947420303432> (date of access: 06.11.2020). – Text: online.
5. Leilei, Yuan, Qi, Li et al. Novel SiC/Si heterojunction LDMOS with electric field modulation effect by reversed L-shaped field plate // Results in Physics. – Vol. 16. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S2211379719325756> (date of access: 06.11.2020). – Text: online.
6. Narziev, M. et al. IAU MDC meteor orbits database – A sample of radio-meteor data from the Hissar Observatory // Planetary and Space Science. – Vol. 192. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S0032063319303502> (date of access: 06.11.2020). – Text: online.
7. Ray, Richard D. Daily harmonics of ionospheric total electron content from satellite altimetry // Journal of Atmospheric and Solar-Terrestrial Physics. – Vol. 209. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S1364682620302285> (date of access: 06.11.2020). – Text: online.
8. Rowe, R. K. et al. Self-healing of circular and slit defects in GCLs upon hydration from silty sand under applied stress // Geotextiles and Geomembranes. – Vol. 48. – Iss. 5. – 2020. – URL: <https://www.sciencedirect.com/science/article/pii/S0266114420300479> (date of access: 06.11.2020). – Text: online.