TRANSFORMED GEOMETRICAL DEVELOPMENT MODELS BASED ON MAJOR SYSTEMS

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Summary. **The process of creation transformed geometric models based on major systems S_n is investigated. Variation of S_n *STS* nomenclature based on the conditions of geometric nature is developed. A form variation process of original models is created, the value of which depends on the future look of the STS, its design features and specifications.**

Keywords: **geometric modules patterns, facet elements.**

Formulation of the problem. With the development of construction, space industry, energy, nanotechnology began to occupy a special place folded transformed system (STS). It is connected with the fact, that they more fully meet the current requirements on the application, which are in a particular area:

    − STS in the construction industry can be used as coatings, flooring, transformed formwork and so on;

    − in energy efficiency STS can be used as a sunscreens transformed systems (to provide requirements on insolation) of transformed solar panels models [5], etc.

    − in space - as transformed folded satellite dishes or solar panels that generate energy from space to Earth [6] and so on.

    The transformed system can be used repeatedly in the starting position they are compact and easy to transport. Applying STS in various fields significant economic benefits can be found, as it was repeatedly proven in practice.

    Analysis of recent research. Development and research of transformed systems were engaged by Bulgakov V., Fesan A., Shyhiyev J., Hladish K., Nikitenko A. and others.

    The wording of the purposes of the article. To investigated the process of creation transformed geometric models based on major systems S_n . To develope variation of S_n *STS* nomenclature based on the conditions of geometric nature is. To create a form variation process of original models, the value of which depends on the future look of the STS, its design features and specifications.

    Main part. It is known [1], that transformed spatial systems represent an ordered set of interrelated and interacting elements - modules
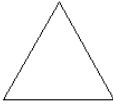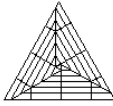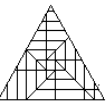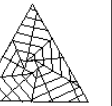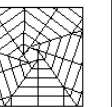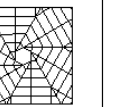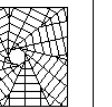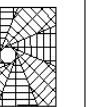
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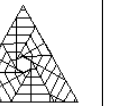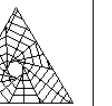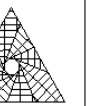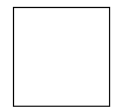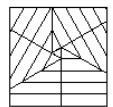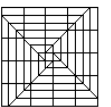
(simple systems, consisting of face elements). The main task for the study of the STS geometric constructing is to determine the geometrical characteristics of the modules, the principles its transformation, creating common methods of construction and development of STS algorithms. One way constructing of STS is compiling them with help of the edge elements (SE) or modules, in this case assembly-technological quality and formative transformed structures completely depend on:

- facet elements geometry;
- transformational capabilities of GE;
- connecting method of GE;
- type GE transformation efforts;
- points of focus to GE.

Geometric patterns modules - individual elements of transformed systems created with polyhedra and polygons. The purpose of the transformation of flat modules is minimization of STS options - lengths, areas, transformation one into other, etc.

From the complex composite predefined conditions, functional, planning, technological and other requirements provided select geometric character: face contour, plan outline, typical section STS model, the conditions of symmetry condition docking plate modules.

Consider Fig. 1. Surfaces of original model S_n from modules K_n correspond symbol: 1.I, 2.II, 3.III, 4.IV, 5.V, 6.VI. If the parameters systems S_n, under a given form of plan, do not meet the technological needs, the process of varying the shape of the original model allows you to change the parameters of systems, from the value of which depends the future appearance of STS and its design features.

Геометрична форма моделі		Тип системи	S_3	S_4	S_5	S_6	S_7	S_8
			1	2	3	4	5	6
		Багатогра-нник / СТС						
трикутник	I							
квадрат	II							
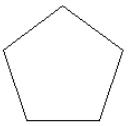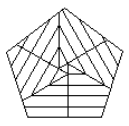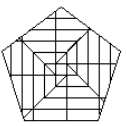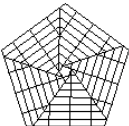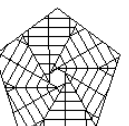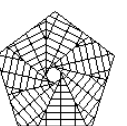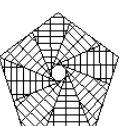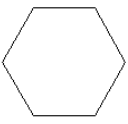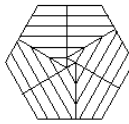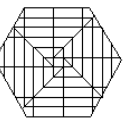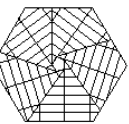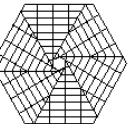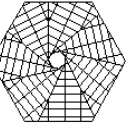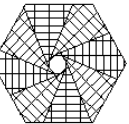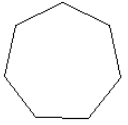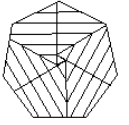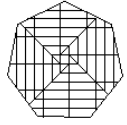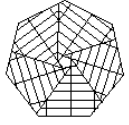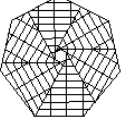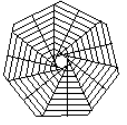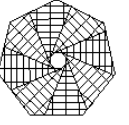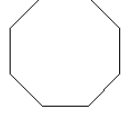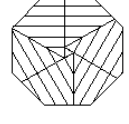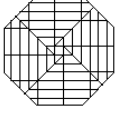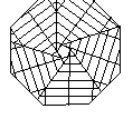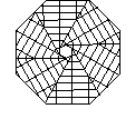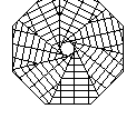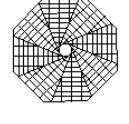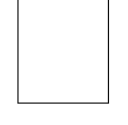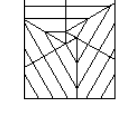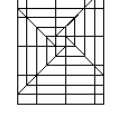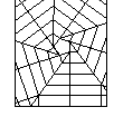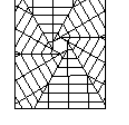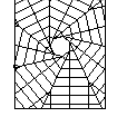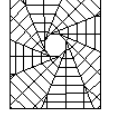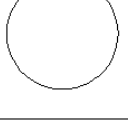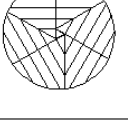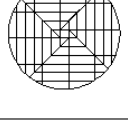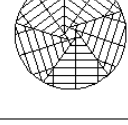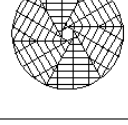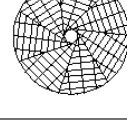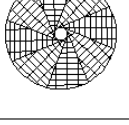
Fig. 1. Geometric transformed models based on major systems.

Fig. 2. Types of STS with unlimited variations of shape parameters

Methods of original S_n design parameters and transformation of the main formative module element K_n, are given in [3,4].

The types of systems, shown in Fig. 1 do not exhaust all kinds of geometric models STS. Unlimited variability of shapes. Formative opportunities such structures conveniently explore their plane models (systems polyhedron) shapes intersection of polyhedra with their symmetry planes or symmetry of rotation. . In research process of models is found a property that allows to construct systems without restriction variance of geometric model form parameters (Fig. 2). Expediency STS form choice depends on the technological, structural properties, functional purpose, calculating the strength, stability and durability of the system.

Conclusions. The process of creation transformed geometric models based on major systems S_n is investigated. If the parameters systems S_n, under a given form of plan, do not meet the technological needs, the process of varying the shape of the original model allows you to change the parameters of systems, from the value of which depends the future appearance of STS and its design features.

Literature

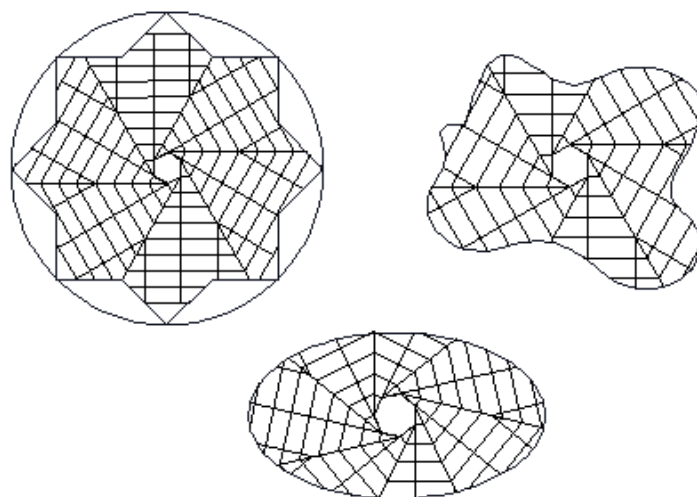1. *Підгорний О. Л.* Геометричне моделювання трансформованих просторових систем із модулів / О.Л. Підгорний, К.К. Гладиш // «Прикладна геометрія і інженерна графіка» Вип. 27. − Київ, 1979. С.8 – 10.
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