III INTERNATIONAL BALTIC SYMPOSIUM ON APPLIED AND INDUSTRIAL MATHEMATICS

I. Cheplyukova, **Y. Pavlov** (Petrozavodsk, IAMR KarRC RAS). **On conditional configuration graphs with arbitrary degree distribution.**

The configuration graph where vertex degrees are independent identically distributed random variables is often used for modeling complex networks such as mobile connections, social networks, the Internet and others [1]. We consider a configuration graph with N vertices. The random variables $\xi_1, \ldots, \xi_N$ are equal to the degrees of the vertices with the numbers $1, \ldots, N$. The degrees of the vertices are drawn independently from an arbitrary given distribution. Let us know only the limit behaviour of this distribution as $k \to \infty$:

$$\mathbf{P}\{\xi_i = k\} \sim \frac{d}{k^g (\ln k)^h},$$

where $i = 1, \ldots, N$, $d > 0$, $g > 1$, $h \geqslant 0$. These graphs were first studied in [2].

We consider two types such conditional configuration graphs. One of them is a subset of graphs where the sum of its vertex degrees is equal to n. In the other subset the sum of vertex degrees was bounded from above by n.

We obtained the limit distributions of the number of vertices with given degree and the maximum vertex degree in these conditional configuration graphs for different relations between the parameters N and n tending to infinity.

REFERENCES

1. *Hofstad R.* Random Graphs and Complex Networks. Cambridge University Press, 2017, 337 p.

2. *Pavlov Yu. L.* Conditional configuration graphs with random parameter of the power-law degree distribution. — SB MATH, 2018, v. 209 (in press).