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A GRAPH WITH INTERSECTION ARRAY $\{18, 15, 1; 1, 5, 18\}$ IS NOT VERTEX-SYMMETRIC

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A. A. Makhnev and V. P. Burichenko found possible intersection arrays of distance-regular locally cyclic graphs with at most 1000 vertices. They proposed a program for studying arc-transitive graphs with these intersection arrays. The neighborhood of a vertex in such a graph is the union of isolated polygons. We study automorphisms of a hypothetical distance-regular graph with intersection array $\{18, 15, 1; 1, 5, 18\}$. In particular, we prove that the automorphism group of this graph acts intransitively on the vertex set.

Keywords: distance-regular graph, graph automorphism.

REFERENCES

1. Burichenko V.P., Makhnev A.A. On completely regular locally cyclic graphs In: *Modern problems of mathematics*: Abstr. all-russian conf. , Ekaterinburg, Russia, 2011, pp. 181–184 (in Russian).
2. Brouwer A.E., Haemers W.H. Graph Spectrum. In: *Spectra of Graphs*. Universitext. Springer, New York. 2012, pp. 1–20. doi: 10.1007/978-1-4614-1939-6_1 .
3. Cameron P.J., van Lint J. Graphs, codes and their links, Ser. London Math. Soc. Student Texts. No 22. Cambridge: Cambridge Univ. Press, 1991, 252 p. ISBN-10: 0521413257 .
4. Gavrilyuk A.L., Makhnev, A.A. On automorphisms of distance-regular graphs with intersection array $\{56, 45, 1; 1, 9, 56\}$. *Dokl. Math.*, 2010, vol. 81, no. 3, pp. 439–442. doi: 10.1134/S1064562410030282 .

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