DICHROMATICALLY UNIQUE DIGRAPHS

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Let λ be a positive integer. An *acyclic λ-coloring* of a digraph D is a partition of the vertices of D such that the chromatic classes induce acyclic subdigraphs in D. The minimum integer λ for which there exists an acyclic λ-coloring of D is the *dichromatic number* $dc(D)$ of D, defined by V. Neumann-Lara in [3].

The *dichromatic polynomial* $P(D;\lambda)$ of D, introduced by A. Harutyunyan in [2], is the number of acyclic λ-colorings of D. A recursive formula for $P(D;\lambda)$ is provided in [1] and we also study dichromatically unique digraphs.

In particular, a digraph D is said to be *dichromatically unique* if $P(D;\lambda) = P(D';\lambda)$ implies that $D \cong D'$. In [1] we proved that the directed cycles on n vertices, the circulant tournament on 5 vertices and the Paley tournament on 11 vertices are dichromatically unique.

In this talk we exhibit new dichromatically unique digraphs.

References

[1] D. González-Moreno, R. Hernández-Ortiz, B. Llano and M. Olsen: The dichromatic polynomial of a digraph, Graphs Combin. 38, no. 3 (2022) Paper No. 85, 16 pp.

[2] A. Harutyunyan: Brook-type results for colorings of digraphs. Ph. D. Thesis, Simon Fraser University, B. C., Canada (2012).

[3] V. Neumann-Lara: The dichromatic number of a digraph, J. Combin. Theory Ser B 33(3) (1982) 265-270.