

STRONGLY UNICHORD-FREE GRAPHS

TERRY A. MCKEE

Department of Mathematics and Statistics
Wright State University
Dayton, Ohio 45435 USA

e-mail: terry.mckee@wright.edu

Abstract

Several recent papers have investigated unichord-free graphs—the graphs in which no cycle has a unique chord. This paper proposes a concept of strongly unichord-free graph, defined by being unichord-free with no cycle of length 5 or more having exactly two chords. In spite of its overly simplistic look, this can be regarded as a natural strengthening of unichord-free graphs—not just the next step in a sequence of strengthenings—and it has a variety of characterizations. For instance, a 2-connected graph is strongly unichord-free if and only if it is complete bipartite or complete or “minimally 2-connected” (defined as being 2-connected such that deleting arbitrary edges always leaves non-2-connected subgraphs).

Keywords: unichord-free graph, strongly chordal graph.

2010 Mathematics Subject Classification: 05C75.

REFERENCES

- [1] A. Brandstädt, V.B. Le and J.P. Spinrad, *Graph Classes: A Survey* (Society for Industrial and Applied Mathematics, Philadelphia, 1999).
doi:10.1137/1.9780898719796
- [2] G.A. Dirac, *Minimally 2-connected graphs*, *J. Reine Angew. Math.* **228** (1967) 204–216.
doi:10.1515/crll.1967.228.204
- [3] B. Lévêque, F. Maffray and N. Trotignon, *On graphs with no induced subdivision of K_4* , *J. Combin. Theory Ser. B* **102** (2012) 924–947.
doi:10.1016/j.jctb.2012.04.005
- [4] R.C.S. Machado and C.M.H. de Figueiredo, *Total chromatic number of unichord-free graphs*, *Discrete Appl. Math.* **159** (2011) 1851–1864.
doi:10.1016/j.dam.2011.03.024

- [5] R.C.S. Machado, C.M.H. de Figueiredo and N. Trotignon, *Edge-colouring and total-colouring chordless graphs*, Discrete Math. **313** (2013) 1547–1552.
doi:10.1016/j.disc.2013.03.020
- [6] R.C.S. Machado, C.M.H. de Figueiredo and N. Trotignon, *Complexity of colouring problems restricted to unichord-free and {square, unichord}-free graphs*, Discrete Appl. Math. **164** (2014) 191–199.
doi:10.1016/j.dam.2012.02.016
- [7] R.C.S. Machado, C.M.H. de Figueiredo and K. Vušković, *Chromatic index of graphs with no cycle with a unique chord*, Theoret. Comput. Sci. **411** (2010) 1221–1234.
doi:10.1016/j.tcs.2009.12.018
- [8] W. Mader, *On vertices of degree n in minimally n -connected graphs and digraphs*, in: Combinatorics, Paul Erdős is Eighty **2** (Bolyai Soc. Stud. Math. Budapest, 1996) 423–449.
- [9] T.A. McKee, *Independent separator graphs*, Util. Math. **73** (2007) 217–224.
- [10] T.A. McKee, *A new characterization of unichord-free graphs*, Discuss. Math. Graph Theory **35** (2015) 765–771.
doi:10.7151/dmgt.1831
- [11] T.A. McKee, *Double-crossed chords and distance-hereditary graphs*, Australas. J. Combin. **65** (2016) 183–190.
- [12] T.A. McKee and P. De Caria, *Maxclique and unit disk characterizations of strongly chordal graphs*, Discuss. Math. Graph Theory **34** (2014) 593–602.
doi:10.7151/dmgt.1757
- [13] M.D. Plummer, *On minimal blocks*, Trans. Amer. Math. Soc. **134** (1968) 85–94.
doi:10.1090/S0002-9947-1968-0228369-8
- [14] N. Trotignon and K. Vušković, *A structure theorem for graphs with no cycle with a unique chord and its consequences*, J. Graph Theory **63** (2010) 31–67.
doi:10.1002/jgt.20405

Received 25 March 2017
Revised 30 August 2017
Accepted 30 August 2017