

$L(2, 1)$ -LABELINGS OF SOME FAMILIES OF ORIENTED PLANAR GRAPHS

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Abstract

In this paper we determine, or give lower and upper bounds on, the 2-dipath and oriented $L(2, 1)$ -span of the family of planar graphs, planar graphs with girth 5, 11, 16, partial k -trees, outerplanar graphs and cacti.

Keywords: 2-dipath $L(2, 1)$ -labeling, oriented $L(2, 1)$ -labeling, homomorphism, planar graph, girth, partial k -tree, outerplanar graph, cactus.

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REFERENCES

- [1] K.I. Aardal, S.P.M. van Hoesel, A.M.C.A. Koster, C. Mannino and A. Sassano, *Models and solution techniques for frequency assignment problems*, Ann. Oper. Res. **153** (2007) 79–129.
doi:10.1007/s10479-007-0178-0
- [2] T. Calamoneri and B. Sinaireri, *$L(2, 1)$ -labeling of oriented planar graphs*, Discrete Appl. Math. **161** (2013) 1719–1725.
doi:10.1016/j.dam.2012.07.009
- [3] G.J. Chang, J.J. Chen, D. Kuo and S.C. Liaw, *Distance-two labelings of digraphs*, Discrete Appl. Math. **155** (2007) 1007–1013.
doi:10.1016/j.dam.2006.11.001
- [4] J.P. Georges and D.W. Mauro, *Generalized vertex labelings with a condition at distance two*, Congr. Numer. (1995) 141–160.
- [5] D. Gonçalves, M.A. Shalu and A. Raspaud, *On oriented labelling parameters*, Formal Models, Languages and Applications **66** (2006) 34–45.
doi:10.1142/9789812773036-0003

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- [6] J.R. Griggs and R.K. Yeh, *Labelling graphs with a condition at distance 2*, SIAM J. Discrete Math. **5** (1992) 586–595.
doi:10.1137/0405048
- [7] P. Hell, A.V. Kostochka, A. Raspaud and E. Sopena, *On nice graphs*, Discrete Math. **234** (2001) 39–51.
doi:10.1016/S0012-365X(00)00190-4
- [8] T.H. Marshall, *Homomorphism bounds for oriented planar graphs*, J. Graph Theory **55** (2007) 175–190.
doi:10.1002/jgt.20233
- [9] A. Pinlou, *An oriented coloring of planar graphs with girth at least five*, Discrete Math. **309** (2009) 2108–2118.
doi:10.1016/j.disc.2008.04.030
- [10] A. Raspaud and E. Sopena, *Good and semi-strong colorings of oriented planar graphs*, Inform. Process. Lett. **51** (1994) 171–174.
doi:10.1016/0020-0190(94)00088-3
- [11] E. Sopena, *The chromatic number of oriented graphs*, J. Graph Theory **25** (1997) 191–205.
doi:10.1002/(SICI)1097-0118(199707)25:3<191::AID-JGT3>3.0.CO;2-G
- [12] E. Sopena, *Oriented graph coloring*, Discrete Math. **229** (2001) 359–369.
doi:10.1016/S0012-365X(00)00216-8
- [13] E. Sopena, *There exist oriented planar graphs with oriented chromatic number at least sixteen*, Inform. Process. Lett. **81** (2002) 309–312.
doi:10.1016/S0020-0190(01)00246-0
- [14] J. van Leeuwen, Handbook of Theoretical Computer Science, Volume A: Algorithms and Complexity (Elsevier and MIT Press, 1990).

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