

## A NOTE ON THE LOCATING-TOTAL DOMINATION IN GRAPHS

MIRKA MILLER (POSTHUMOUS)

*School of Mathematical and Physical Sciences*  
*University of Newcastle, Australia*  
*Department of Mathematics*  
*University of West Bohemia, Pilsen, Czech Republic*

**e-mail:** mirka.miller@gmail.com

R. SUNDARA RAJAN

*Department of Mathematics, Anna University, Chennai-600 025, India*

**e-mail:** vprsundar@gmail.com

R. JAYAGOPAL, INDRA RAJASINGH

*School of Advanced Sciences, VIT University, Chennai-600 127, India*

**e-mail:** jgopal89@gmail.com  
indrarajasingh@yahoo.com

AND

PAUL MANUEL

*Department of Information Science, Kuwait University, Safat, Kuwait*

**e-mail:** pauldmanuel@gmail.com

### Abstract

In this paper we obtain a sharp (improved) lower bound on the locating-total domination number of a graph, and show that the decision problem for the locating-total domination is NP-complete.

**Keywords:** dominating set, total dominating set, locating-dominating set, locating-total dominating set, regular graphs.

**2010 Mathematics Subject Classification:** 05C69.

### REFERENCES

- [1] I. Charon, O. Hudry and A. Lobstein, *Minimizing the size of an identifying or locating-dominating code in a graph is NP-hard*, Theoret. Comput. Sci. **290** (2003) 2109–2120.  
doi:10.1016/S0304-3975(02)00536-4
- [2] M. Chellali, *On Locating and differentiating-total domination in trees*, Discuss. Math. Graph Theory **28** (2008) 383–392.  
doi:10.7151/dmgt.1414
- [3] X. Chen and M.Y. Sohn, *Bounds on the locating-total domination number of a tree*, Discrete Appl. Math. **159** (2011) 769–773.  
doi:10.1016/j.dam.2010.12.025
- [4] J.-F. Fang, *The bipancycle-connectivity of the hypercube*, Inform. Sci. **178** (2008) 4679–4687.
- [5] M.R. Garey and D.S. Johnson, *Computers and Intractability: A Guide to the Theory of NP-Completeness* (W.H. Freeman & Company Publisher, San Francisco, US, 1979).
- [6] T.W. Haynes, M.A. Henning and J. Howard, *Locating and total dominating sets in trees*, Discrete Appl. Math. **154** (2006) 1293–1300.  
doi:10.1016/j.dam.2006.01.002
- [7] M.A. Henning and C. Löwenstein, *Locating-total domination in claw-free cubic graphs*, Discrete Math. **312** (2012) 3107–3116.  
doi:10.1016/j.disc.2012.06.024
- [8] M.A. Henning and N.J. Rad, *Locating-total domination in graphs*, Discrete Appl. Math. **160** (2012) 1986–1993.  
doi:10.1016/j.dam.2012.04.004
- [9] H. Hosoya and F. Harary, *On the matching properties of three fence graphs*, J. Math. Chem. **12** (1993) 211–218.  
doi:10.1007/BF01164636
- [10] B.N. Omamalin, *Locating total dominating sets in the join, corona and composition of graphs*, Appl. Math. Sci. **8** (2014) 2363–2374.  
doi:10.12988/ams.2014.43205
- [11] P.J. Slater, *Fault-tolerant locating-dominating sets*, Discrete Math. **249** (2002) 179–189.  
doi:10.1016/S0012-365X(01)00244-8
- [12] J. Xu, *Topological Structure and Analysis of Interconnection Networks* (Kluwer Academic Publishers, London, UK, 2001).  
doi:10.1007/978-1-4757-3387-7

Received 6 January 2016

Revised 20 June 2016

Accepted 20 June 2016