The Tree Number of Power Graphs Associated With Specific Groups and Applications

A. R. Moghaddamfar

Department of Mathematics, K. N. Toosi University of Technology,
P. O. Box 16315-1618*, Tehran, Iran*

E-mail: moghadam@kntu.ac.ir

Abstract

The power graph $\mathcal{P}(G)$ of a group G is an undirected graph whose vertex set is G and two vertices $x, y \in G$ are adjacent if and only if $\langle x \rangle \subseteq \langle y \rangle$ or $\langle y \rangle \subseteq \langle x \rangle$ (which is equivalent to say $x \neq y$ and $x^m = y$ or $y^m = x$ for some non-negative integer m). Clearly, the power graph $\mathcal{P}(G)$ of any group G is always connected. The number of spanning trees of the power graph $\mathcal{P}(G)$ of a group G, which is denoted by $\kappa(G)$ and call the tree-number of G, will be investigated for certain finite groups G in this talk. Indeed, the explicit formula for the tree-number of a cyclic group or a generalized quaternion group is obtained. We have also determined, up to isomorphism, the structure of any finite group G for which $\kappa(G) < 125$.

AMS Subject Classification 2010: 05C10, 05C45.
Keywords and Phrases: power graph, tree-number, cyclic group, generalized quaternion group.

References

[1] I. Chakrabarty, S. Ghosh and M. K. Sen, *Undirected power graphs of semigroups*, Semigroup Forum, 78 (2009), 410-426.

[2] A. R. Moghaddamfar, S. Rahbariyan and W. J. Shi, *Certain properties of the power graph associated with a finite group*, Submitted.

[3] A. R. Moghaddamfar, S. Rahbariyan, S. Navid Salehy and S. Nima Salehy, *The number of spanning trees of power graphs associated with specific groups and some applications*, Submitted.