Normal Subgroup Based Power Graph of a Finite Group

Seyed Ali Reza Ashrafi Ghomroodi  
University of Kashan  
ashrafi@kashanu.ac.ir  

Nasrin Malek-Mohammadi  
University of Kashan  
nasrinmalekmohammadi@yahoo.com

Let $G$ be a finite group and $N \trianglelefteq G$. The normal subgroup based power graph $\Gamma_N(G)$ is an undirected graph with vertex set $(G \setminus N) \cup \{e\}$ in which two distinct vertices $a$ and $b$ are adjacent if and only if $aN = b^mN$ or $bN = a^nN$, for some positive integers $m$ and $n$. In this talk, we report on our recent results on the normal subgroup based power graph of a finite group. As a consequence of this talk, a characterization of all pairs $(G, N)$ of a finite group $G$ and a proper non-trivial normal subgroup $N$ of $G$ such that $\Gamma_N(G)$ is split, bisplit or $(n-1)$–bisplit are given. Moreover, all finite groups $G$ with $c$–cyclic normal subgroup based power graph, $c \leq 4$, will be determined.