1154-05-1278 **Harish Vemuri*** (`harish.vemuri@yale.edu`). *Domination in direct products of complete graphs.*
Let X_n denote the unitary Cayley graph of $\mathbb{Z}/n\mathbb{Z}$. We continue the study of cases in which the inequality $\gamma_t(X_n) \leq g(n)$ is strict, where γ_t denotes the total domination number, and g is the arithmetic function known as Jacobsthal's function. The best known result in this direction is a construction of Burcroff in 2018 which gives a family of n with arbitrarily many prime factors that satisfy $\gamma_t(X_n) \leq g(n) - 2$. We present a new interpretation of the problem which allows us to use recent results on the computation of Jacobsthal's function to construct n with arbitrarily many prime factors that satisfy $\gamma_t(X_n) \leq g(n) - 16$. We also present new lower bounds on the domination numbers of direct products of complete graphs, which in turn allow us to derive new asymptotic lower bounds on $\gamma(X_n)$, where γ denotes the domination number. Finally, resolving a question of Defant and Iyer from 2017, we completely classify all graphs $G = \prod_{i=1}^{t} K_{n_i}$ satisfying $\gamma(G) = t + 2$. (Received September 14, 2019)