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Improved Bounds for Burning Fence Graphs

Graph burning studies how fast a contagion, modeled as a set of fires, spreads in a network. The burning process occurs over discrete time-steps, or rounds. In each round, a fire breaks out at a vertex, thus burning that vertex. Fires spread from burning vertices to their neighbors in successive rounds. The burning number of a graph G is the minimum number of rounds necessary for every vertex of G to burn. We consider the burning number of the $m \times n$ Cartesian grid graph, $G_{m,n}$. For $m = \omega(\sqrt{n})$, the asymptotic value of the burning number of $G_{m,n}$ was determined, but for $m = O(\sqrt{n})$, only the growth rate of that burning number was investigated. As such, we give new explicit bounds on the burning number of $G_{c\sqrt{n},n}$, where $c > 0$; a graph which we refer to as a fence graph. This is joint work with Anthony Bonato, Sean English, and Bill Kay.