

1096-05-1099

Sarah Spence Adams, Noura Howell, Nathaniel Karst, Denise Sakai Troxell and Junjie Zhu* (junjie.zhu@students.olin.edu). *On the $L(2, 1)$ -Labelings of Amalgamations of Graphs.*

The problem of assigning frequencies to transmitters in a radio network can be modeled through vertex labelings of a graph, wherein each vertex represents a transmitter and edges connect vertices whose corresponding transmitters are operating in close proximity. In one such model, an $L(2, 1)$ -labeling of a graph G is employed, which is an assignment f of nonnegative integers to the vertices of G such that if vertices x and y are adjacent, $|f(x) - f(y)| \geq 2$, and if x and y are at distance two, $|f(x) - f(y)| \geq 1$. The λ -number of G is the minimum span over all $L(2, 1)$ -labelings of G . Informally, an *amalgamation* of two graphs G_1 and G_2 along a fixed graph G_0 is the simple graph obtained by identifying the vertices of two induced subgraphs isomorphic to G_0 , one of G_1 and the other of G_2 . We provide upper bounds for the λ -number of the amalgamation of graphs along a given graph by determining the exact λ -number of amalgamations of complete graphs along a complete graph. We also provide the exact λ -numbers of amalgamations of rectangular grids along a path, or more specifically, of the Cartesian products of a path and a star with spokes of arbitrary lengths. (Received September 12, 2013)