1035-Z1-1104 **John J Villalpando*** (`villalpando@gonzaga.edu`), Gonzaga University, Department of Mathematics, 502 East Boone, Spokane, WA 99258, and **Renu C Laskar**. *Irreducible no-hole colorings of grid graphs, hypercube and other bipartite graphs.*

The channel assignment problem is the problem of assigning radio frequencies to transmitters while avoiding interference. This problem can be modeled and examined using graphs and graph colorings. L(2,1)-colorings were first studied by Griggs and Yeh as a model of a variation of the channel assignment problem. An L(2,1)-coloring of a graph $G$ is an integer labelling of the vertices where adjacent vertices differ in label by at least two, and vertices that are at distance two from each other differ in label by at least one. A no-hole coloring is an L(2,1)-coloring of a graph which uses all the colors from $\{0, 1, \ldots, k\}$ for some integer $k$. An L(2,1)-coloring is irreducible if no labels of vertices in the graph can be decreased and yield another L(2,1)-coloring. A graph $G$ is inh-colorable if there exists an irreducible no-hole coloring on $G$.

In this paper we consider the inh-colorability of bipartite graphs. Using an algorithm we will prove that sufficiently large finite grid graphs are inh-colorable. Next we consider the hypercube and demonstrate that for small $n$ the $n$ dimensional hypercube is inh-colorable. Finally, we obtain some sufficient conditions for a bipartite graph to be inh-colorable. (Received September 18, 2007)