Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-05-258 **Xiaohua Teresa Jin*** (jin2@math.sc.edu), Mathematics Department, University of South Carolina, Columbia, SC 29208, and **Jerrold R. Griggs**. *Real Number Radio Channel Assignment for the Triangular Lattice and the Square Lattice.* Preliminary report.

The channel assignment problem is to assign radio frequency channels to transmitters in a network, using a small span of channels and satisfying some frequency separations to avoid interference. Griggs and Yeh (1992) introduced the corresponding integer graph $L(2,1)$-labeling problem, which has been the object of a considerable number of papers.

We extend it and propose the real number graph labeling problem, which allow the labels and the constraints k_i to be nonnegative real numbers. An $L(k_1, k_2, \cdots, k_p)$-labeling of graph G is an assignment of nonnegative real numbers to the vertices of G with $x \in V(G)$ labeled $f(x)$, such that $|f(u) - f(v)| \geq k_i$ if u and v are at distance i apart, where $k_i \in [0, \infty)$. We denote by $\lambda(G; k_1, k_2, \cdots, k_p)$ the minimum span over such labeling f. We show $\lambda(G; k_1, k_2)$ is a continuous and piecewise-linear function of k_1, k_2, and $\lambda(G; k_1, k_2) = k_2\lambda(G; k, 1)$ for real numbers $k = k_1/k_2, k_2 > 0$.

In a radio mobile network, we may get all transmitters placed in the triangular lattice $\Gamma_\triangle$ or the square lattice $\Gamma_\square$. We determine values $\lambda(\Gamma_\triangle; k, 1)$ for all $k \geq 4/5$ and $\lambda(\Gamma_\square; k, 1)$ for all $k \geq 0$. (Received September 03, 2004)