1056-05-1749 **Jeffrey Mudrock*** (mudrock2@illinois.edu), **Lucas Allen**, **Ryan Bunge**, **Saad El-Zanati**, **Daniel Gannon**, **Kyle Knee** and **Jessica Smith**. *On λ-fold Rosa-type Labelings.*

Let $V(K_n) = \mathbb{Z}_n$ and define the *length* of an edge $\{i, j\} \in E(K_n)$ to equal $\min\{|i-j|, 2n+1-|i-j|\}$. A *Rosa-type labeling* of a graph G with n edges is an embedding of G in K_{2n+1} (with $V(K_{2n+1}) = \mathbb{Z}_{2n+1}$) that has exactly one edge of each length i for $1 \le i \le n$. Rosa-type labelings with additional restrictions lead to cyclic G-decompositions of either K_{2n+1} or of K_{2nx+1} for all positive integers x. Understandably, labelings that lead cyclic G-decompositions of K_{2nx+1} are deemed more useful. We introduce the concept of a λ-fold Rosa-type labeling of a graph G of size n and show that some of these labelings lead to cyclic G-decompositions of the λ-fold complete multigraph ${}^{\lambda}K_{\frac{2nx}{\lambda}+1}$ for all positive integers x. These results were obtained at an REU Site for Pre-service and In-service Secondary Mathematics Teachers at Illinois State University. (Received September 22, 2009)