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

1003-15-1244 **Kinnari R. Patel*** (`matkrpx@langate.gsu.edu`), Department of Mathematics and Statistics, 750 College of Education Building (7th floor), 30 Pryor Street, Atlanta, GA 30303-3083. *Some Eigenvalue Results for Certain Matrices Associated with Graphs.*

In this talk, various results on the adjacency matrix, the Standard Laplacian, and the Normalized Laplacian of a graph will be presented, with a special emphasis on interlacing results. For regular graphs G and H, a precise relationship has been obtained between the eigenvalues of the Normalized Laplacian of $G \times H$, $\mathcal{L}(G \times H)$, and those of $\mathcal{L}(G)$ and $\mathcal{L}(H)$. Let G be a $k-$regular graph of order n and H be an $l-$regular graph of order m. Then we prove that $\mathcal{L}(G \times H) = \frac{k}{k+l}[\mathcal{L}(G) \otimes I_m] + \frac{l}{k+l}[I_n \otimes \mathcal{L}(H)]$. For the Normalized Laplacian, the following new interlacing result has been obtained: Let G be a graph and $H = G - e$, where e is an edge of G. Let $\lambda_1 \geq \lambda_2 \geq \ldots \geq \lambda_n = 0$ be the eigenvalues of $\mathcal{L}(G)$ and $\theta_1 \geq \theta_2 \geq \ldots \geq \theta_n$ be the eigenvalues of $\mathcal{L}(H)$. Then, $\lambda_{k-1} \geq \theta_k \geq \lambda_{k+1}$ for each $k = 1, 2, 3, \ldots, n$, where $\lambda_0 = 2$ and $\lambda_{n+1} = 0$. (Received October 04, 2004)