1135-05-942 **Aida Abiad**, **Boris Brimkov**, **Aysel Erey**, **Lorinda Leshock**, **Xavier Martinez-Rivera*** (xaviermr@auburn.edu), **Suil O**, **Sung-Yell Song** and **Jason Williford**. *On the Wiener index, distance cospectrality and transmission-regular graphs.*

Let G be a simple, loopless, connected graph. The distance matrix D of G is the (symmetric) matrix whose rows and columns are indexed by the ordered vertices of G, and whose (i, j)-entry is the distance between the ith and jth vertices. Two graphs are D-cospectral if their distance matrices have the same spectrum. The Wiener index of G, a topological index used in theoretical chemistry as a structural descriptor for organic molecules, is half of the sum of all the entries of D. The Laplacian matrix of G is $L = \Delta - A$, where A and Δ are the adjacency and degree matrices of G, respectively. The eigenvalues of L are called the Laplacian eigenvalues of G.

A graph is k-transmission-regular if the sum of each of the rows of its distance matrix is equal to k, and k is called the transmission regularity of the graph.

In this talk, a new construction of D-cospectral graphs is presented, as well as tight bounds on the transmission regularity of a transmission regular graph. Particular attention will be paid to a certain class of tree-like graphs, for which a result establishing a link between their Wiener index and Laplacian eigenvalues will be given, which generalizes a result of Mohar and Merris (whose result only holds for trees). (Received September 17, 2017)