Meeting: 1001, Evanston, Illinois, SS 16A, Special Session on Spectral Problems of Differential Operators

1001-34-8 **Wu-Jian Peng**, Department of Mathematics, Northern Illinois University, DeKalb, IL 60115, **Mihai T. Racovitan*** (racovita@math.niu.edu), Department of Mathematics, Northern Illinois University, DeKalb, IL 60115, and **Hong-You Wu**, Department of Mathematics, Northern Illinois University, DeKalb, IL 60115. *Geometric Aspects of Sturm-Liouville Problems, V. Natural Loops of Boundary Conditions for Monotonicity of Eigenvalues and Their Applications.* Preliminary report.

For a given Sturm-Liouville equation, we prove several new monotonicity results about its eigenvalues on the space of self-adjoint boundary conditions, and show that the monotonicity does not change along certain natural loops in this space. These results yield a general way for finding and/or proving inequalities among eigenvalues for different boundary conditions. For example, we obtain a natural explanation and a short proof of the inequalities among eigenvalues for coupled boundary conditions and those for separated boundary conditions established by Eastham, Kong, Wu and Zettl; moreover, two sequences of new inequalities among eigenvalues for coupled boundary conditions are derived. (Received April 19, 2004)