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James V Lambers* (james.lambers@usm.edu), 118 College Dr #5045, Hattiesburg, MS 39406-0001. *Approximate Diagonalization of Variable-Coefficient Differential Operators Through Similarity Transformations*. Preliminary report.

Approaches to approximate diagonalization of variable-coefficient differential operators using similarity transformations are presented. These diagonalization techniques are inspired by the interpretation of the Uncertainty Principle by Feferman, known as the *SAK* Principle, that suggests the location of eigenfunctions of self-adjoint differential operators in phase space. The similarity transformations are constructed using canonical transformations of symbols and anti-differential operators for making lower-order corrections. Numerical results indicate that the symbols of transformed operators can be made to closely resemble those of constant-coefficient operators, and that approximate eigenfunctions can readily be obtained. (Received September 23, 2012)